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OPERATIVE SURGERY AND TECHNIQUE

McQueeney A. Carbohydrate Feeding in Surgical Cases. *Am J Surg* 1916 xii, 164.

McQueeney believes that acetone formed as the result of the action of ether upon the organism, and the by products of a rich protein diet following operation are responsible for many of the post operative discomforts and for faulty wound healing. He tried out a special diet as follows. Before operation meat and eggs were eliminated for a period of three days. After operation for three days a solution of malt sugar or 20 per cent dextromaltose was given, five ounces every four hours if awake.

A series of 34 test cases (celiotomies) under this regimen healed clean and without any disagreeable symptoms such as nervous excitability, distention or nausea and vomiting of any considerable degree. In 46 control cases of a similar nature 75 per cent (clean cases) became infected, 75 per cent had considerable distention, an equal number were anxious and excited and 85 per cent vomited or were considerably nauseated.

ALBERT EISENBERG

Ochsner A. J.: The Prevention of Obstruction of the Passage of Gas Following Operations on the Colon. *J Am. M. Ass.* 1916 lxxv, 483.

Ochsner believes that in operations on the colon the greatest danger to the patient comes from tension caused by obstruction to the passage of gas. He describes several methods by which the accumulation of gas above the seat of operation may be prevented as follows:

1. Reder's method for cases in which the cecum has been removed and the ileum implanted into the transverse colon. The end of the ileum is passed out through a button hole in the abdominal wall about 10 cm. beyond the point at which the anas-

tomosis between the closed end of the transverse colon and the end of the ileum is made. A tube is inserted into the free end of the ileum which will permit the gas to escape which may accumulate in the ileum until the entero-anastomosis has healed. When the drainage tube is removed the fistula will heal spontaneously.

2. In case the separation is so great that the ileum cannot be implanted into the transverse colon without tension, the free end of the colon is closed, the ileum is anastomosed low down to the sigmoid flexure, and a rubber drainage tube is carried up through the rectum and the entero-anastomosis into the ileum after the method of Lane and stitched in place.

3. When short-circuiting for intestinal stasis (anastomosing the ileum to the sigmoid) the short distal stump of the ileum which remains attached to the cecum can be brought out through a button hole at McBurney's point. This opening can be used for irrigation.

4. In addition to the above the sigmoid may be divided just proximal to its anastomosis with the ileum and its proximal end passed out through a button hole in the left flank, thus draining the excluded colon at both ends (Gillet's procedure).

5. In case the descending colon has to be removed for tumor or diverticulitis, the colostomy according to Gillet's method can then be placed at a point corresponding to the distal end of the remaining colon. (Under these conditions or the conditions outlined in the preceding paragraph the stump of the ileum attached to the cecum may be closed if desired, so that the colon will be drained only by the colostomy.)

6. Where a portion of the sigmoid must be resected but there is sufficient left for a direct anastomosis to bridge the gap, Gibson's method is the

fibrous constriction which may be considered as a periarthritis of the temporomaxillary articulation. In about 80 per cent of the cases jaw constriction appears to be caused by muscular contraction. It is not a trismus since the constriction is observed in old wounds.

This form of constriction very much resembles what was formerly known as hysterotraumatism and is now studied by neurologists under the names, hypermyotony, acromyotony etc. Although the jaws are tightly locked they can easily be opened with a mouth-opener provided the process is slow and gradual. They are rarely associated with jaw fractures.

The authors believe that there is a parallel between constriction of this kind in war and in contraction of limbs after injury, from the rapidity with which both phenomena arise and in the fixation of the attitude which becomes more rebellious the longer it is untreated. But unlike the myotony of the limbs, myotonic constriction of the jaws has a benign prognosis.

W. A. BUCHAN

Valadler A. C. Suggestion for the Treatment of Fractured Jaws. *Brit J Surg* 916, iv 64.

The author reports a number of interesting jaw injuries and their treatment accompanied by photographs of appliances used to assist in correcting the deformity. Among the latter are shown the method of wiring the teeth when one jaw is splinted against the other in cases of fracture and an external vulcanized splint for the same purpose.

Where the lower jaw was shot away from the second bicuspid to the second bicuspid of the other side, a splint was used with a Jack screw attachment by means of which the fractured ends could be gradually forced apart as the callus formed, thus gradually restoring the contour of the jaw.

Other splints depicted were a prophylactic splint, a palate splint, an inclined plane made to retain the lower jaw in place, and an elevator cap splint, employed for a fracture at the median line and anterior to the first molar.

D. L. DINEEN

Naffziger H. C. Prospects of Surgical Treatment in Meningitis. *Clin N J Med* 96 xl 3

The extreme gravity of meningeal infections compared to infections in other regions of the body is due to the great vascularity of the tissues and the fact that absorption takes place directly into the blood stream. Furthermore, the central nervous system is highly sensitive to the direct action of poisons and the protective substances formed in the body as a response to the infection cannot find their way into the cerebrospinal fluid and accordingly cannot assist in combating the infection. Infection causes increased secretion of fluid by the choroid plexus. If this increase be in excess of the absorption, or if the absorptive channel is blocked, the increase in intracranial pressure alone can cause a fatal termination in meningeal infections.

In considering surgical treatment of meningitis the above factors must be clearly borne in mind. These cases with obstruction to the outflow of fluid from the ventricles are the most favorable for surgical interference. The intraventricular pressure can be relieved by ventricular puncture and, in cases of epidemic meningitis, an opportunity is offered for the injection of Flemer serum directly into the ventricular spaces. In case the normal outlets for the absorption of the fluid (the pachyion granulations and other arachnoid villi) are blocked by the products of infection surgery affords very little relief and is not indicated except for the introduction of sera. The two types of cases may be differentiated by a lumbar injection of phenolsulphone phthalein which should appear in the urine in ten minutes.

The author briefly refers to the various surgical procedures advocated for the treatment of meningitis and cites his experience with the Haynes operation for drainage of the posterior system. He operated upon two cases of pneumococcus infection one of which died on the tenth, the other on the third day and one of streptococcus infection which died twelve hours after the operation. His experience does not lead him to regard his operation favorably. One case of meningitis following fracture involved the middle fossa operated upon by subtemporal decompression with drainage promptly recovered. No infecting organism was grown on cultures from the fluid. This case had a marked Kernig optic disks hyperemic cell count of 75 (all polymorphs) in the spinal fluid globulin reaction present sugar absent.

Naffziger's conclusions are. In general meningeal infections, frequent lumbar punctures with slow withdrawal of 10 to 50 ccm. of fluid have a definite value. If there is increased intracranial pressure as shown by choked disk, intraventricular pressure is best relieved by the Haynes operation or by a corpus callosum puncture. If the increased pressure be due to faulty absorption little can be expected from any operative procedure.

E. FENELL

Zimmerman B. F. Brain Injuries. *Am J Surg* 96 xxx 54.

The author offers some anatomical and physiological observations on the membranes and circulation of the central nervous system. The dura being more closely attached to the cranial bones about the base is more likely to be torn in basal fractures than in those of the vault. In children being more firmly attached to the sutures than elsewhere, extradural hemorrhage is more likely to be confined to one bone than in adults. In the spinal canal the dura is not attached to the vertebrae but hangs as a long elastic tube capable of distention. Normally there is very little space between the dura and pia arachnoid but it is increased by accumulation of fluid in cases of cerebral compression.

The cortical veins empty for the most part into the longitudinal sinus by way of the lacunae laterales.

which extend outward one half to one inch from the longitudinal fissure.

The pachionian bodies which are extensions from the arachnoid containing cerebrospinal fluid are thrust into the lacunae. Therefore the dura in this region is very closely attached to the brain and consequently its separation in operations or injuries is attended by serious hemorrhage the cerebral veins being torn in the process.

The cavernous and petrosal sinuses are liable to injury in basal fractures blood from the petrosal enters the subdural space and escapes through the ear.

Normally the amount of cerebrospinal fluid is small except in the cisternae of the arachnoid at the base. In case of brain injury these act as a water bed for the brain. The common symptom of headache following brain injury, however slight is explained by the edema producing dural tension or distention the dura being supplied by the fifth nerve and extremely sensitive to pressure. Delirium and mania are due to irritation stupor and coma to paralysis of the cortical centers. One may follow the other condition or both occur together. Thus early unconsciousness may be followed by severe headache and later delirium or as in cerebral hemorrhage delirium may precede the unconsciousness, in the latter case if there is an alcoholic odor to the breath, the mistake of a diagnosis of alcoholism may be made.

Focal symptoms depend primarily on location, but also on the character of the injury which occurs as four types (1) laceration (2) concussion (3) contusion (4) compression one or all of these may be present in any given case. Pure concussion however is now regarded as very doubtful it being generally believed that this is nothing but microscopic contusion.

The phenomenon of increasing blood pressure in cases of compression is explained on the theory of vasomotor stimulation. This takes place when the intracranial pressure has reached a point where it shuts off the arteries to the brain causing anemia which stimulates the vasomotor center and in turn produces a rise in systemic blood pressure which overcomes the brain anemia.

The choked disk is not the typical form but is a dilatation of the veins and contraction of the arteries. It is often transitory and frequent examinations are therefore necessary. In cases where doubt exists as to pressure lumbar puncture may be of much value and is safe except in cases with very high blood pressure. In these there is the danger that withdrawal of the fluid will allow the medulla to be crowded down into the foramen magnum. The pressure should always be measured before any fluid is withdrawn. In edema following compression or contusion relief may be afforded by spinal puncture alone.

Depressed fractures of the cranial vault if involving the silent area, may produce but slight symptoms and often appear trivial but owing to the

danger of serious sequelae as epilepsy or psychoses they should be operated on as a rule. In cases of compression however slight the patient should be carefully watched and any signs of increasing compressing force as shown by the rise of blood-pressure slowing of the pulse or respiration, changes in the fundus of the eye and increase in cerebrospinal pressure are indications for operation. Surgical treatment in cases where there are no localizing symptoms or signs is subtemporal decompression. The mistake must not be made of waiting until positive signs of paralysis or beginning paralysis of medullary centers appear as shown by increase in the pulse-rate lowering of the blood pressure etc.

In cases of fracture of the base the author is of the opinion that decompression will afford a greater percentage of cures than expectant treatment.

HORACE BINNEY

Grey E G: Studies of the Localization of Cerebellar Tumors—the Cranial Nerves. *Bull Johns Hopkins* 11 p 1916 xvi 251

This study deals with the significance of cranial nerve involvements. It is based upon an analysis of the records of 63 cases with intra or extracerebellar tumor confirmed either at operation or on post mortem examination. As previously stated by the author the material has been drawn from the records of a series of several hundred patients with syndromes of cerebellar disease in Cushing's neurological service at the Johns Hopkins Hospital previous to October 1912 and at the Peter Bent Brigham Hospital since that date.

The salient points gathered from this experimental study are as follows:

1. Since anemia in cases with intracranial tumor is usually a distant symptom due to a secondary internal hydrocephalus, it has no appreciable significance in the localization of the new-growths. Uncinate gyrus symptoms may appear secondary to an internal hydrocephalus. The sense of smell was affected in about 7 per cent of the 63 certified cases analysed in this report.

2. While choked disc in itself has no appreciable localizing significance, since it is not infrequently noted comparatively early in the course of certain supratentorial tumors. It may have some importance in this respect when it is associated with other signs. It has been the author's experience that the early appearance and high degree of changes in the eye grounds when they appear in company with some of the so-called cerebellar symptoms, are important confirmatory evidence pointing toward a subtentorial localization of the new-growth.

3. Very little reliance can be placed on an involvement of the third or sixth cranial nerve as a guide to the side occupied by the new-growth in the localization of tumors in one or another part of the posterior fossa.

The observations recorded in this paper are in favor of the view held by many that the nystagmus seen in cerebellar disease is very frequently of cere-

bellar origin—an asynergy of the eye muscles. The rule which states that the nystagmus is slower and coarser with the eyes turned toward the tumor is subject to many exceptions. When, however, there is a definite and persisting difference in the size and rate of the jerks with the eyes in the lateral position, the nystagmus is usually suggestive of the side of the lesion.

Since impairments of conjugate deviation of the eyes are only infrequently encountered in the less advanced cases of subtentorial tumor they have relatively little importance in the localization of tumors within the posterior cranial fossa. True deviation of the eyes in cerebellar new-growths is rarely seen prior to operation.

In subtentorial tumors involvements of the fifth cranial nerve have no topographical importance in diagnosis (within the posterior fossa) unless the tumor lies in one cerebellopontine angle or the other. Such a localization is likely only when the homolateral eighth (or soventh) nerve is also affected.

A paresis or paralysis of one facial nerve in tumors of the posterior cranial fossa is strong presumptive evidence of the side of the lesion though a paresis appears not infrequently in median growths. When the eighth or the (fifth) nerve of the same side is also affected, the diagnosis of a homolateral growth may be made. A questionable involvement of the seventh nerve on the other hand, is deceptive in this respect due, probably to the relative frequency of normal facial asymmetries of slight degree.

In subtentorial new-growth a slight unilateral impairment of hearing, which has appeared for the first time in company with general pressure symptoms, is indicative either of a homolateral tumor or less frequently of a median growth. When hearing, under similar circumstances, is greatly impaired or lost in one ear it points toward a homolateral extracerebellar localization of the tumor. Such a diagnosis is confirmed when either the seventh or the fifth nerve of the same side is also affected.

Tinnitus, it appears, is not a reliable guide to the side occupied by a tumor situated below the tentorium.

Although vertigo is a prominent symptom of subtentorial tumors as compared with growths situated elsewhere in the brain, it has no appreciable significance for the localization of the diseases in one or another part of the posterior fossa.

The presence of dysarthria and dysphagia, unless they are very marked in patients with subtentorial tumors, though a source of anxiety is no contra indication to operation, since neither is a reliable sign of an impending respiratory paralysis. When they occur they constitute two of the most striking symptoms of intra and extracerebellar new-growths.

The spinal accessory nerve is only rarely involved (in less than 5 per cent) in tumors of the posterior cranial fossa. When this nerve is affected, the

muscular weakness is not marked and it is homolateral to the growth.

A weakness of the muscles innervated by one twelfth nerve is of very little significance in the localization of tumors in one part or another of the posterior fossa.

GEORGE E. BELLIS

Heuer G J and Dandy W E. A Report of Seventy Cases of Brain Tumor. *Bull Johns Hopkins Hosp* 9 6 xxvii, 124.

The authors have reviewed the cases of brain tumor in patients who have entered the surgical service of Dr Halsted between September 1 1912 and January 9 15 and in the present communication these cases are considered for the purpose of commenting upon some of the problems indicated. The authors also indicate in this paper the value of some of the more common diagnostic aids, and relate a few experiences in the pathology and differential diagnosis of brain tumors and finally emphasize steps in surgical technique that have favorably influenced their mortality and operative results.

Conditions other than true brain tumor were included in the 70 cases which form the basis of this report i.e., ependymitis, pachymeningitis interna hemorrhagica, encephalitis, arachnoiditis, cerebral tubercle, dural gumma, and aneurism of the internal carotid artery. Yet the symptoms in these conditions simulated so closely those of brain tumor that operations were usually performed under the supposition that a new-growth was present. Of these 70 cases the nature and position of the lesion was established by the authors at operation or at autopsy in 40 or 57 per cent and two additional cases were certified through operations performed by Cushing. The remaining 8 patients presented definite signs and symptoms of brain tumor and in the great majority of instances were operated upon, the operation however failing to disclose the lesion.

Of the 70 patients, 62 were operated upon. Of the 8 patients not operated upon, 6 refused operation, one had such extensive pulmonary tuberculosis that operation seemed inadvisable, and one died suddenly in the ward before operation. Seventy-one major operations were performed on these 62 patients i.e. upon several patients, on a second admission, an exploratory craniotomy was performed subsequently to a subtemporal decompression. There were 6 deaths occurring between 24 hours and five days after operation—an operative mortality of 8.6 per cent, a case mortality of 9.6 per cent. Two patients subsequently died in the hospital, their condition and subsequent death being apparently uninfluenced by operative procedures. Including these the total mortality was 11 per cent and 12.8 per cent respectively. There were no deaths upon the operating table.

A number of cases are reported by the authors in considerable detail and accompanying the study are numerous illustrations and photographs.

GEORGE E. BELLIS

White, A. H. Report of Case of Gliosarcoma of Uncinate Gyrus. *Pacific M J* 1916 lix 466

The author reports a case of sarcoma of the brain in a patient aged thirty-seven years, whose first complaint was amnesia, which became progressively worse another symptom which was quite prominent was anosmia, first unilateral and then bilateral.

Röntgen examinations were negative as were also repeated Wassermann tests. With the exception of slight prostatitis, a left varicocele and hemorrhoids, the physical examination revealed nothing. Antisyphilitic measures were of no benefit. From the symptoms and findings a diagnosis was made of intercranial lesion.

The intercranial pressure the choked discs the uncinate attacks during which the patient became red, or cyanotic and flushed the amnesia the anosmia the lack of headache, and the lack of localizing motor symptoms, seem to point to a new growth in the frontotemporal region and because of the anosmia, probably in or near the gyrus uncinatus.

This interesting case is fully reported with detailed autopsy findings which confirm the diagnosis. The sarcoma was of the mixed-cell type.

EMIL C. ROBERTS.

Quiron, D.: Fibromyxosarcoma of the Brain (Fibro-mixto-sarcoma del cerebro) in *el cuerpo de San José* 1916 I, 19.

The case reported occurred in a woman of 30. Examination showed the principal symptoms to be anemia convergent strabismus, papillary reaction to light slow thyroid somewhat hypertrophied evidences of syphilitic malaria rotation reflexes exaggerated Babinski sign strong clonus of foot also quite marked. No Kernig's sign was present degeneration was imperfect and she could not close her mouth, which gave her an idiotic appearance.

The Wassermann reaction was completely negative. The symptoms increased in intensity from day to day. About ten days after entering the hospital the patient experienced sharp pains along the vertebral column, also intense cephalitis. Lumbar puncture gave abundant clear fluid but contrary to the findings of Lebehoulet (in a case of pia mater sarcoma) nothing was found on microscopical examination. The Widal test was negative. The author believed that it was a case of cerebral tumor the patient died in coma about two months after entering the hospital.

In this case the author points out that none of the classical symptoms of tumor of the frontal lobe were present. The cephalitis and vertigo are common to all cerebral tumors no matter what the location. The autopsy in the case showed the dura strongly distended, corresponding with the left frontal lobe. There were no adhesions. In the left frontal lobe and in its posterior part there was a tumor the size of a small orange. The result of histological examination

of this tumor showed that it was a fusiform myxofibrosarcoma and absolutely typical.

The author thinks that surgical intervention if made would have been without satisfactory result. In an examination of the literature on this topic, he has not been able to find any sarcomatous tumor of such a size as that he describes.

W. A. BRENNAN.

Marchack. Cerebral Hernia (Hernies cérébrales) *Presse Méd* 1916 p 35

Cerebral hernia may be distinguished as occurring either with or without adjacent abscess. In the first form the abscess must at once be opened so that it may not discharge into the ventricle. These patients almost all succumb to meningoccephalitis. But the hernia without abscess is of more interest as it is susceptible of treatment.

Marchack thinks that the cause of these cerebral hernia is congestive edema of the traumatized brain and that the tumor projected across the insufficiently opened dura mater becomes strangled and adherent to the ring.

Such a hernia usually occurs within a few hours of injury. It is not due to hypertension because its volume diminishes only very slightly after lumbar punctures.

Probably one half of those with gunshot cranial wounds show hernia especially if the injury is in the right parietal region and even if the osseous breach is small. In wounds of the frontal and occipital region hernia is rare.

In treating hernia Marchack has tried all methods from ablation by the thermocautery to simple compression. He thinks that the treatment of choice is after a certain period to enlarge the strangulating ring remove bone fragments, etc. lavage with 20 per cent formal and compression. In the course of treatment patients show crises of Jacksonian epilepsy but repeated lumbar punctures cause them to disappear.

W. A. BRENNAN.

NECK

Pierce F. I. Traumas of the Neck and Spine *Surg Gynec Obst* 1916 xliii 332

The author discusses contusions and sprains of the back excluding all those with a disability of less than one week and those which are complicated by dislocation or fracture of the spine. Contusions are included with the sprains because of the difficulty at times in distinguishing one from the other particularly when the contusion is directly over the spine itself.

Of 758 cases reviewed 277 were classed as contusions and 481 as sprains. Of the 277 contusions 29 per cent were located in the lumbar region 16 per cent in the dorsal region, and 10 per cent in both the dorsolumbar and sacral regions. In 20 per cent the location was not specified. Out of 481 sprains 420 or 87 per cent were due to indirect causes and 47 per cent of these involved the dorsolumbar and

lumbar region. Of 61 due to direct causes, 47 per cent involved the same region. Cervical sprains, next in frequency were present 31 times, and all but two were due to an indirect cause.

It is impossible to draw a distinct line between sprains involving the spinal muscles alone and those involving the ligaments and articulations. All of the back injuries are frequently complicated by nervous symptoms, but the severity of the injury is no index to the degree of nervous symptoms present.

The period of disability in sprains depends upon the severity of the injury and a tracers from a few weeks to six months or more. In those cases complicated by a neurosis, or as in the case of malingers and damage seekers, the disability may be a year or longer.

Great care must be exercised in making the diagnosis. Minor injuries must not be exaggerated nor severe ones overlooked. In examining the patient it should be borne in mind that a fracture may be present and a careless handling may produce a dislocation or may even cause death.

All ligamentous sprains require rest and support for the spine while muscular sprains, after a short period of rest should have massage and be given some moderate and gradually increasing gymnastic exercises. The complications should be treated according to symptoms.

Cases are cited showing the variety of injuries and the different complications met with.

Sloan, H. G. The Götter Problem. *Child and M.*
J. 9 6 455.

The author accepts it as highly probable that goiter is due to lack of iodine in the system, that the thyroid gland can be stimulated through the central nervous system alone to give up its iodine, that in acute infections foreign proteins circulating in the blood cause increased thyroid activity which in turn activates the central nervous system to cause increase in general body oxidation in order to overcome the invading micro-organism. Thyroid enlargement has been observed in all acute infections but is especially noticeable in incipient tuberculosis. An infection in a person whose thyroid has only a small reserve functioning capacity (all individuals who live in a goiter belt) is prone to cause thyroid hypertrophy.

The varying types of thyroid enlargement from colloid goiter to Graves disease are one varying only in degree and intensity. The colloid goiter will ultimately give toxic symptoms (myocarditis) and should always be removed though in the first stages iodine may control the goiter. The toxic symptoms of Graves disease are the result of an overabundant thyroid secretion which damages the whole body. The forcible heart-beat (pykno-cardia) is the result on the heart of the excess of adrenalin arising from the adrenals through their stimulation by way of the brain via the splanchnics. The excess thyroid secretion stimulates

the output of nervous activity by the central nervous system which in turn stimulates the thyroid to still greater activity causing a vicious circle which must be broken either at the focus of infection or at the thyroid by thyroidectomy. If the cause of Graves disease be undue nervous or mental strain the only way to break the circle is by thyroidectomy.

The author gives an interesting description of the symptoms and signs of the incipient type of thyroid intoxication and emphasizes the importance of a search for and ridding of all causes especially a girl of marriageable age and for possible foci of infection. Thyroid enlargement associated with incipient tuberculosis is a type frequently seen and must always be denied. The distinctive points in diagnosis are pointed out and the correct treatment is given as rest in bed out-of-door life over feeding and small doses of iodine.

In the adolescent type there is thyroid enlargement without any toxic symptoms (a compensatory hypertrophy) or the border line Graves disease with loss in weight or the heavy type seen chiefly in boys. It is usually accompanied by some intestinal tract being the underlying cause. Operative interference is not advised in the adolescent type. A type termed cold Graves is next described which occurs in women in whom constipation is a known factor and the whole symptom-complex is referable to intestinal stasis. Rest both physical and mental with proper nourishment and attention to proper elimination are the chief factors in correct treatment. In hypertonus associated with old colloid goiter there is usually no loss of weight but the heart beat is irregular and forcible. The blood-pressure may run from 180 to 200 mms. of mercury. Thyroidectomy gives prompt relief to this class of patients, but should be undertaken only after the heart-muscle has been properly supported by digitalis.

The author advocates giving children living in goiter regions who are going through puberty small amounts of iodine once in three months. To pregnant women about it is advisable to give small amounts of iodine (five drops of the syrup of the iodine of iron) one month out of three.

The treatment of Graves disease as given in detail by the author may be briefly outlined as follows. Careful search by every known means for a possible focus of infection in any region of the body. If such a focus be found remove it. If not eliminate the products of bacterial decomposition in the intestinal tract as far as possible. Thyroid (five grains) one pint of buttermilk daily little or no meat and vegetables generously is the routine. The syrup of the iodine of iron one to two minims, or painting the skin the size of a quarter with tincture of iodine is used with due regard to a possible increase of all bad symptoms during the medication. If, after one month there is no improvement surgical interference is indicated.

For successful surgery in Graves disease it is

necessary to know the ability of the body to neutralize acid waste products of metabolism. The respiratory center responds very quickly to increased acidity in the blood stream. Inability of a patient to hold his breath more than forty seconds is taken as the limit of safety regarding his ability to neutralize acids. A pulse rate of 120 while in bed, a degree of fever during the day, and signs of lowered alkaline reserve are contra-indications for immediate lobectomy. Two to ten weeks are allowed to pass under treatment by the following milder methods: injection into the gland of 5 to 10 drops of 50 per cent quinine and urea solution, the injection of 25 to 50 ccm. boiling water, and ligation of the superior thyroid arteries and their sympathetic nerves.

In severe cases operation is done without the knowledge of the patient that it is to take place. It is performed under full anesthesia with as little trauma as possible after thoroughly blocking the tissues to be handled. Four fifths of the gland is removed in no case has myxedema followed the operation.

Patients with localized adenoma are advised to undergo operation as soon as their condition permits. In large colloid goiters compressing the trachea the lateral attachments of the posterior parts of the gland are allowed to remain as a support to prevent tracheal collapse. In cases with high blood pressure showing marked myocarditis digitalis is given before and after operation. Post-operative rest is insisted upon in all cases to allow the tired nervous system to recover.

With the treatment as above outlined the author claims 95 per cent cures in patients presenting themselves for treatment the first two or three months of the disease. This percentage drops proportionately to the amount of damage done to vital organs by delay in seeking relief or incorrect diagnosis. E. FISCHER.

Wilson, L. B. and Durante, L. Changes in the Superior Cervical Sympathetic Ganglia Removed for the Relief of Exophthalmos. *J. Med. Research* 1916 xxxiv 375

The present investigation is based on a study in fixed tissue of the pathologic changes in cervical sympathetic ganglia removed at operation from 16 patients with hyperplastic toxic goiter in the Mayo clinic, from December 17, 1912 to December 31, 1915 according to the technique described by C. H. Mayo. Within this period sympathectomies were done on 24 patients but in 8 instances the excised specimen either did not contain ganglionic tissue or the small amount therein was needed for examination in the fresh state. These are not included in the present study. The questions to be determined are:

1. Are the cervical sympathetic ganglia in hyperplastic toxic goiter a seat of demonstrable histologic changes?

2. If such histologic changes in the cervical sympathetic ganglia exist, is there a relationship be-

tween them and the clinical symptoms on the one hand and the pathologic changes in the thyroid on the other?

3. If histologic changes are not demonstrable is the apparent absence due to faulty technique or to the fact that the sympathetic ganglia have received only impulses which have left no trace in their structure?

The 20 ganglia constituting the material on which the present study is based were removed at operation from 16 patients with hyperplastic toxic goiter. From 2 of these patients the right superior ganglion only was removed, from 3 the left superior only and from 11 both right and left superior ganglia were removed. In 5 instances the right or left or both the right and left middle superior ganglia were also removed. Small pieces of ganglia were examined in frozen sections of the fresh tissue immediately after operation by the method described by Wilson.

The remainder of the specimen or specimens was fixed in 10 per cent formalin, and reserved for subsequent examination. In all 35 ganglia from 24 patients were examined either in sections of fresh tissue or in sections of fixed tissue.

Each ganglion was divided transversely into equal parts. One the superior part which contained the majority of the afferent and efferent branches was further subdivided longitudinally into two parts. One of these was used for silver nitrate impregnation and the other for Flemming's strong solution. The inferior part was divided transversely into small segments of a few millimeters each. Some of these were used for staining with hematoxylin and eosin, some with Weigert van Gieson for connective tissue, some with Weigert-Luden for myelin, some with Held-Nissl for distribution of chromatin, some for specific fat iron, and pigment reactions and some for silver nitrate impregnation. All preparations were examined in serial paraffin sections except those cut frozen for the study of pigment.

From a critical review of previously reported observations, from the authors' observations of control specimens not herein detailed and from their study of the specimens from the 16 cases reported in this paper they present the following summary which they believe to be a fair statement of their present knowledge of the lesions of the cervical sympathetic ganglia in hyperplastic toxic (exophthalmic) goiter.

1. The cells of cervical sympathetic ganglia from patients over 40 years of age and occasionally though rarely from those younger, may show hyperchromatization, hyperpigmentation, chromatolysis, and atrophy in minor degrees commonly designated cell senility but due to arteriosclerosis, chronic toxemia, overwork or other factors which cannot be accurately determined. Of the 16 cases studied, only 3 were over forty years of age. Of these, 2 showed lesions of the ganglion cells far beyond those seen in any of the controls. There was only one case in which the cell lesions

were of such a character and degree as to have permitted their explanation by senility. In this patient, who was forty-four years of age, the only symptoms of hyperthyroidism were goiter, exophthalmos, Stellwag's sign and diarrhoea. However the extreme sclerosis of the ganglion would not appear to be explicable by senility alone.

2. Sympathetic ganglia removed more than four hours after death, except under the most favorable mortuary conditions, may show autolytic changes which must be differentiated from pathologic lesions. The ganglia studied in this paper were all fixed within five minutes after removal from the living patient. Most of the control material from neoplasms was fixed within three hours after death.

3. While van Gieson's stain is valuable for general histologic details and Nissl's stain for the study of early chromatin changes, the use of Ramon y Cajal's and Levaditi's stains is especially to be recommended for the study of details of late cell destruction. The use of Sudan III in the differentiation of cell-pigment and of Weigert-Ludow's stain for myelin is also important.

4. It would appear from the authors' examination by the methods detailed that definite histologic changes do occur in the cervical sympathetic ganglia in hyperplastic toxic (exophthalmic) goiter.

5. These histologic changes consist of various stages of degeneration: (1) hyperchromatism; (2) hyperpigmentation; (3) chromatolysis; and (4) atrophy or (5) granular degeneration of the nerve-cells. All of these are but successive steps in degeneration, which if uninterrupted, proceed to the complete destruction of the ganglion cell affected. Not all of the ganglion cells in any of the ganglia examined were so completely destroyed as to render improbable their return to normal under favorable conditions. There is some evidence that in ganglia from cases clinically improved some of the cells have partially or wholly recovered.

6. Some of the ganglia contain cells resembling the partially differentiated cells in the ganglia of infants.

7. Accompanying the more advanced changes in the ganglia cells are similar degenerative changes in the nerve-fibers, and an increase of connective tissue throughout the ganglion but especially in the outer and middle coats of the vessels and in the periganglionic tissue.

8. So far as may be determined from the small number of observations herein recorded, in the early stages of hyperthyroidism, with advanced parenchymatous hypertrophy and hyperplasia of the thyroid, the total number of cells in the cervical sympathetic ganglia is not greatly reduced, but a very large proportion of the cells present show varying though marked degeneration. The partial remission of clinical symptoms, accompanied by regression of the parenchymatous hypertrophy and hyperplasia in the thyroid, is associated with a much greater reduction in the total number of cells in the ganglia, but of the cells which remain relatively

fewer show the varying stages of degeneration than do those in ganglia from patients in the early stages of hyperthyroidism. Thus, in general, the pathologic changes in the cervical sympathetic ganglia are parallel to the stage and intensity of the symptoms of hyperthyroidism, and to the hyperplastic and regressive changes in the thyroid. These statements however must be regarded as only tentative, and must wait corroboration by carefully correlated clinical and pathologic studies of a much larger number of cases, the authors state.

Whether the changes observed are the result of overstimulation and overwork of the ganglion cells, as Crile believes is true of the Purkinje cells of the cerebellum or whether the changes are due to direct toxic action upon the cells themselves, the authors believe is as yet mere speculation.

GEORGE E. BAILEY

Alkins, W. H. B. The Etiology and Treatment of Exophthalmic Goiter with Special Reference to the Use of Radium. *Med. Press & Circ.* 96, 62.

Hyperthyroidism is not the only etiological factor in Graves' disease. No enlargement of the thyroid gland is associated with exophthalmos, and both symptoms may be absent in an otherwise typical case. The etiology is yet obscure, but two theories have been advanced: the glandular and the neurogenic. Against the glandular theory militates the probability of the thymus, suprarenals, hypophysis and ovary and possibly other internal secretory glands being etiological in involved. The facts at our disposal show that a predisposing factor is necessary which is to be looked for in the central nervous system. This explains the directly inherited cases. Exophthalmic goiter may follow typhoid, rheumatism, diphtheria, influenza, and be present in tuberculosis and chlorosis or according to McCarrison, it may be due to some non-specific infection.

As to treatment there is a reasonable prospect of recovery in about seventy-five per cent of the medical as well as the surgical cases. The word cure is used in the sense that the condition is relieved so as to no longer interfere with ordinary occupation. Having in brief reviewed the various medications whose name is legion and about which the most contradictory statements are current, the author deals more specifically with roentgen and radium treatment.

Roentgen treatment has been extensively used both alone and in combination with surgery. Satisfactory results have been reported by several writers (Helenboeck, Nagelschmidt), and others go so far as to say that no operation for this condition should be undertaken without preliminary treatment by roentgen rays and that if this procedure were universally adopted it would be likely to materially reduce the operative mortality of exophthalmic goiter. Belot states that even when struma is absent the rays have a favorable influence on

excessive deficient or perverse function of the gland

Clinical experience shows that many cases do not respond satisfactorily to any of the methods mentioned, and in these refractory cases the author has found the employment of radium to be of decided benefit. Abbe of New York first used radium successfully in exophthalmic goiter and his favorable results have been confirmed by others. The experiments of Victor Horsley and Finzi show that the most constant changes after the application of radium affect the blood and lymph vessels. The author's clinical experience shows that the more penetrating radium rays diminish the vascularity and reduce the secretion of the gland. Dawson Turner thinks that radium has two definite advantages over roentgen rays the possibility of giving definite doses and the possibility of administering it without noise or excitement while the patient remains in bed. The author reports seven cases all of which were benefited by radium treatment.

In conclusion the author briefly deals with hydrophobic measures and refers to the psychological aspect of the condition which he considers of significance in relation to the treatment. He therefore, thinks it highly advisable that physicians who have not had much experience with neurotic and neurosomatic patients and consequently do not understand them and have no sympathy with them should refrain from undertaking the medical treatment of cases of this kind, in which the psychic element is such an important feature.

Pfahler, G. E., and Zulick, J. D.: The Treatment of Exophthalmic Goiter (Basedow's or Graves Disease) by Means of the Roentgen Rays. *Proc. M. J.* 1916 xix, 661

The authors briefly review the theories of the etiology of exophthalmic goiter especial emphasis being directed to the work of Kendall and Wilson at the Mayo Clinic. The close relationship between exophthalmic goiter and hyperplasia of the thymus gland is shown by numerous quotations from the literature regarding favorable results obtained by exposing the thymus to roentgen rays. Similar favorable results have been obtained by other observers after exposing the ovaries to the rays.

The theory of the beneficial action of the X-ray on the thyroid in exophthalmic goiter is that in this disease we have a hyperplasia of cells and accumulation and the X-ray is known to have a selective destructive action on highly specialized epithelial cells especially those of the embryological type. There is a mass of evidence in the literature both for and against the use of the rays in exophthalmic goiter and by a purely statistical study it is impossible to arrive at a definite conclusion. The authors have given the subject very close study and from their own experience in twenty cases have worked out a definite plan of treatment with the X-ray which they give in detail. Their work leads to the following conclusions

1 It is justifiable to give all cases of exophthalmic goiter a trial treatment with an interval of one month to observe its effect. Nothing is lost if operation is then decided upon, and many cases can thus be saved from operation.

2 Treatment should be directed at both the thyroid and the thymus glands. An increase in weight and a decrease in pulse-rate are the first signs of improvement and are practically always found. Hypothyroidism will be produced by too prolonged treatment. The goiter and the exophthalmos show little if any improvement. E. FISCHER.

Judd E. S. and Pemberton J. D.: Results of Operations for Exophthalmic Goiter. *Med. Press & Circ.* 1916 cli 125

The authors present a statistical study of cases operated upon at the Mayo clinic in 1909. Of the 176 patients 121 were traced. These 121 patients are divided into five groups. Group 1 Fifty five patients, or 45 per cent cured. Group 2 Twenty two patients or 18.1 per cent, practically cured of their symptoms but still had traces of the disease. Group 3 Seven cases markedly improved but most of the time there was evidence of the old trouble—exophthalmos or nervousness. Group 4 Five patients with only slight improvement. Group 5 Eight patients with little or no benefit. In Groups 3, 4 and 5 are several cases which had only one or two ligations and which might possibly be cured by a resection.

The average length of time required to effect a cure was 17.9 months. The average length of time the cured patients had symptoms before coming to operation was 19.3 months. In the group receiving no benefit the average time of symptoms was 22.3 months. In spite of the closeness of these figures the authors believe that a greater percentage of cures would have been effected if the cases had been operated upon earlier. The eye symptoms (all the cases in this series had distinct exophthalmos) were the first to improve following operation. Some patients with the subjective feeling of tension, stated that the eyes felt much better before any reduction in the exophthalmos was noticeable.

In regard to the functional results of the operation, the low collar incision heals quickly and normal function of the head and neck returns in a few weeks. Disturbance of the voice was noted in some patients. It was apt to become marked the fourth or fifth day but always disappeared.

Of the 176 patients operated upon in 1909 21 died 7 in the hospital. These patients were all operated upon at the maximum of the severity of the disease, because at that time the danger of operation at the height of a paroxysm was not so fully realized as it is at present. Fourteen patients have died since leaving the hospital. They lived an average of 14.1 months. Eleven had dilated hearts there was edema in six and evidence of nephritis in four. These cases were of the extreme type with irreparable damage to vital organs. E. FISCHER.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Bull P. Extrapleural Thoracoplasty in Pulmonary Tuberculosis. *Extrapleurale Thorakoplastik bei Lungentuberkulose*. *Tr. VI North S. & C. S.* Gortborg. 9, 6, July.

The author has performed thoracoplasty in 11 cases of pulmonary tuberculosis since May 1914. Local anesthesia was employed. Paravertebral incision, resection of the ribs from the eleventh or tenth to the third or second inclusive (once the first rib was included). Up to 83 square centimeters have been resected, but the author believes that such a large area is not necessary. 120 to 30 centimeters being sufficient in most cases. Four patients were cured—2 cases were operated on more than 2 years ago, one a year ago and one three months ago. One died a considerable time after the operation—9 and 3 months—from extension of the tuberculous process in the lung and from hemorrhage. One is living two years after the operation but is gradually getting worse. On living a year after the operation, it is better than formerly but signs of the healthy lung becoming involved are present. Three died one to two weeks after the operation, 2 of infection, one of an unknown cause, probably heart failure. The author believes that the infection in the two fatal cases originated in the apex of the lung in spite of the fact that during the operation no foci or cavities were opened.

In all 11 cases an extensive lesion of one lung existed which had been treated expectantly for one and one half to two years without success. The other lung in 3 cases showed no clinical symptoms of involvement. In the other cases minor changes were demonstrable in the other lung but were considered stationary.

CHRISTENSEN stated that he had performed the operation in 5 cases. In 3 of them the disease was confined to one lung. In one case after an apicolysis operation the disease spread to the lower portion of that lung after a thoracoplastic operation, however the patient became free from fever, the cough ceased, and the bacilli disappeared from the sputum. The operation is performed with the patient in the sitting position to prevent an aspiration pneumonia.

HOLMSTROM as an internist urged that pneumothorax should first be tried. If not successful the operation may be advised, since it is not at all serious if the patient is in good condition. He has sent from his sanitarium 6 patients to have the operation performed and in 4 of these the effect of the operation was remarkable.

KRYG had operated upon 3 cases of which one is much improved. He always includes the first rib and prefers to operate in two stages. The pain is not severe if the operation is done conservatively. The intercostal nerves should be saved if possible.

EURLY had previously reported 3 cases operated on and he also advised conservatism and that the operation be done in two stages. In one case all ribs were resected and the cough did not cease. Resection of the clavicle was tried to obtain a collapse of the cavity but only after a large plug of fat was applied did the sputum decrease to 15 ccm. after which the patient was again able to resume his occupation.

L. A. JUNKER.

Herricks A. E. Dermoids of the Mediastinum. *Am. J. M. S.* 9, 6, July, 05.

There are but 73 cases of mediastinal dermoids reported in the literature. The author's case was that of a woman aged twenty-three years who had always enjoyed good health. In November 1914 she had some difficulty in respiration and a sense of fullness in the neck. Shortly afterward a bulging was noticed above the breast bone. A number of surgeons made a diagnosis of mediastinal sarcoma and refused treatment. Examination of the bulging in the suprasternal notch showed a tumor covered with skin and slightly reddened. The tumor was tender to the touch and presented a semi-fluctuating resistance. On percussion there was dullness extending on either side of the sternal borders and downward as far as the angle. A diagnosis of mediastinal dermoid was made. The operation consisted in a transverse incision over the upper border of the sternum, extending well beyond the insertion of the sternomastoid muscle. Insertions of which were severed. The superior pole of the globular mass was readily exposed. This was freely incised and a grayish yellow greasy fluid escaped. After this was sponged out a mass the size of a walnut presented. This was covered with fine lanugo-like hair the color of a newly hatched gosling. The appearance of this mass established the diagnosis.

In reviewing the literature the author notes the fact that the majority of the cases have been observed in early adult life, the largest number being noted between the ages of twenty and thirty. The sex of the patients is about evenly divided.

The premonitory symptoms are of two groups: those due to pressure and those due to irritation of the environment by the epidermoidal contents. The most frequent symptoms were due to encroachment upon the environment by the expanding tumor.

The pressure symptoms are most frequently manifested by cough and dyspnea, less often as pain from pressure. This symptom was present in 18 cases. Cough when due to pressure is caused by irritation of the nerves. Cough of another type was caused by irritation of the bronchi when perforation was impending. When due to irritation the character of the cough is similar to that noted in pressure from aneurism.

Dyspnoea was noted in 23 cases. In 3 instances death occurred in dyspnoic attacks. Dysphagia was present in 3 cases. The gradually increasing amount of the cyst contents probably undergoes some chemical change which inflames the sac and irritates the environment. In this they imitate the life history of wens.

The typical location of the simple dermoid of the mediastinum is that of a sac occupying the space between the sternum, great vessels, pericardium and soft tissues covering the episternal notch.

In structure, the two types may be distinguished those in which epidermoidal tissue alone is present (28 cases) and those in which tissues from two or more germ layers are in evidence (25 cases).

The simple epidermoidal type usually consists of a simple cyst or at most a conglomeration of cysts the lining of which is covered with stratified epithelium, with hair follicles and with sweat and sebaceous glands, but a few cysts have been noted in which all appendages have been absent. Some of the simpler cysts have compartments lined with columnar epithelium with or without cilia. The contents of cysts is usually composed of cells, fatty material and hair. The material when in a fresh state may be honey like.

In the more complicated teratoid type in addition to the epidermoidal elements, cartilage and bone are frequently found. Less often teeth have been noted. Glands, supposedly from the gut tract and from the thyroid have been recorded. Non-striated muscle-cells have also been observed.

The origin of dermoid and teratoid tumors of the mediastinum is closely associated with the development of the thymus and thyroid glands. The close relation between the ectodermal and endodermal elements in the neck has been pointed out by Minot. That mediastinal dermoids have their origin in the upper part of the sternum is evident from their topography. Even those tumors which exhibit their greater bulk in the lower thorax retain attachments high under the sternum. In some of the reported cases bands have extended up as far as the thyroid, suggesting an even higher origin.

The differential diagnosis must be made from aneurism, tuberculosis, empyema, malignant and benign tumors.

C. G. HEYD

TRACHEA AND LUNGS

Villeon L. P. de la Extraction of Intrapulmonary Projectiles with Forceps Under the Screen (Extraction des projectiles intrapulmonaires à la pince sous-écran) *Bull et mém Soc de chir de Par* 19 6 2311 1889

De la Villeon gives a detailed report of his method and the principal results of it. Fifty-eight cases have been operated with 58 successes. 31 of these were personal operations of the author in which he removed 32 projectiles situated from 2 to 12 cm. deep in the pulmonary parenchyma. The other 27 cases were operated upon by his colleagues and in-

cluded the removal of 34 projectiles at various depths.

There are two radiologic interventions: (1) for the exact localization of the projectile; (2) during the operations to guide the movements of the forceps toward the projectile. The procedure, as pointed out by Faure, is undoubtedly to a great extent a blind operation and as such is more or less objectionable according to the strict rules of surgery but its success depends on the degree of skill obtained by the operator in the technique of the method which skill can be acquired by experience and practice.

The method is moreover only applicable to the smaller and smooth class of projectiles. Larger projectiles or those situated in the hilum cannot be removed by forceps removal in such cases is effected by thoracotomy. Even if in the course of an extraction by the author's method an accident should occur a thoracotomy can always be immediately performed.

W. A. BRENNAN

Gloux L.: Traumatic Pulmonary Tuberculosis (Tuberculose pulmonaire traumatique) *Presse Méd* 1916 p 394.

The author reports two cases of traumatic pulmonary tuberculosis in wounded soldiers. In the first case the patient received a bullet injury in the right thoracic region. Examined four months later by the author the man showed bilateral tuberculosis of the two apices which was confirmed by radiocopy. The patient before injury was a vigorous healthy subject without personal or hereditary antecedents.

The second case was similar but even more demonstrable. This was a healthy man who for many months had borne the hard life of the trenches without suffering. He received a voluminous shell injury in the left breast causing abundant spitting of blood and functional disturbance. Within eight months all the symptoms of a localized tuberculosis at the traumatized point were noted.

W. A. BRENNAN

Lambert S. E. Suppurations of the Lung and Pleura with Their Surgical Indications. *North-west Med* 1916 21 253

Since nearly all suppurations of the chest are secondary the author believes that careful taking of the history is of the utmost importance. For eign bodies, trauma, tumors, syphilis, influenza, pneumonia, pertussis, operative procedures of the nose, mouth, and throat, laparotomy, abscess of the liver, perirenal abscess, actinomycosis and always tuberculosis, must be considered. Unresolved pneumonia he is slow to accept as a satisfactory or even a working diagnosis. Thorough physical examination and a careful examination of the sputum should be made. Hemoptysis is of little diagnostic importance.

Lambert believes that the roentgen ray examination is very helpful and should be used with both screen and plate in different positions with

or without bismuth injections. Of no less value is bronchoscopy.

The use of local anesthesia is increasing. Chloroform he believes, should never be used if ether nitrous oxide, or local anesthesia are available. Either by the open method he believes to be safe and sufficient but he claims some distinct advantages for gas oxygen anesthesia.

The position of the patient on the table is most important preferably he should be lying on the abdomen or on the diseased side, never on the sound side. The ventral position is the safest. In the event of collapse as a result of pneumothorax while operating, the lung should be grasped or the lung tissue sewed to the surrounding wall margin.

Obstinate putrid bronchitis has been successfully treated by artificial pneumothorax as has also paralytic relaxation of the diaphragm by division of the phrenic nerve. Bronchiectasis, Lambert believes, is either operable or incurable. The mortality is high about 50 per cent. The best results are probably obtained from preliminary artificial pneumothorax or by ligation of the branch of the pulmonary artery and finally excision of the involved diseased lobe.

Empyema, he believes may be treated by simple thoracentesis under the following conditions: (1) if not frankly purulent (2) if pneumococcal organisms cannot be grown on culture media (3) if due to tuberculosis, not secondarily infected (4) if not due to streptococci. Empyema is often more successful with children than with adults. Murphy's method of formalin and glycerine injections has not met with general acceptance. He believes, of those operated upon, 50 per cent make a smooth recovery 25 per cent require two or more operations, and many of these never recover completely while 25 per cent die during the first few weeks.

He would make the incision where the aspirating needle has demonstrated pus. However intercostal drainage or rib excision is better preferably the ninth or tenth rib between the posterior axillary line and the tip of the scapula should be excised.

Lilienthal's method Lambert believes, is worthy of consideration although it has been too little used to justify its acceptance as a marked advance in the treatment of these cases. He believes in the use of a half inch rubber tube for drainage but specifies that the length must be sufficient to reach well into the cavity and should remain until the lungs have expanded and obliterated the cavity. The wearing of the tube rather too long does no harm.

In the use of suction to aid the expansion of the lungs, the rubber valve of Cabot is successful. In the after care, the dressing should be changed infrequently the best of hygienic surroundings provided, and pulmonary exercises used, such as blowing bottles or a horn.

In the chronic cases as a preliminary it is wise to drain the lowermost point of the cavity and, after six weeks, to perform one of the radical opera-

tions. Lambert does not believe in the use of vaccine treatment.

Recovery is dependent upon three factors: (1) adequate drainage (2) abolition of cavity by rendering possible the contact of lungs and chest wall (3) good hygiene.

The types of operation are: (1) lung expanding decortication of Fowler, Deform and Ranschoff, (2) parietal collapsing of Oestlander, Schede and Widus, (3) muscle filling as advocated by Robinson and (4) extrapleural fat implantation of Tuffier.

Kocher's procedure seems the most logical the value of Beck's bismuth paste in the author's opinion, is limited. Acute abscess of the lungs is particularly amenable to surgery chronic abscess is always slow on account of the area of indurate pneumonia which surrounds the cavity after a few weeks. The difficulty of diagnosing usually permits the most favorable time for operating to pass. The technique of operating is simple but the location of the abscess cavities may be most difficult.

In conclusion Lambert emphasizes the following points:

1. X-ray and bronchoscopy are most desirable aids in chest surgery.
2. Do not operate with the patient lying on the sound side.
3. Do not aspirate lung abscesses through the unopened chest wall.
4. Except for emergency drainage, make the incision sufficiently large to explore with the hand.
5. When using the rib spreader guard against lacerating the diaphragm.
6. Traction on the lung lessens collapse from and densely produced pneumothorax.
7. Do not attempt too much at once. Shock is at its worst about two hours after the operation.
8. Be prepared to change the diagnosis after the chest is opened.
9. Do not irrigate or inject cavities that connect with the bronchus, or remove drainage too early.
10. Resourcefulness and imagination are valuable assets in thoracic diagnosis and operation.

Em. C. ROBERTS.

Navarro, I. C. and Garrahan, I. P. Sarcoma of the Lung in the Infant (Sarcoma de pulmón en el niño). *Praxis Méd. Argent.*, 9, 6, III, 78.

Primary sarcoma of the lung in childhood is extremely rare. According to Zuber Sabatini, and other authors, there are less than a dozen cases in the literature. The authors state that there are some Argentine cases which do not figure in the statistics published.

Metastatic sarcoma of the lung are more frequent than primary. Mueller in 1891 in a total of 623 cases of malignant tumors found 12 per cent of pulmonary metastases in carcinomata and 39.9 per cent in sarcomata, which shows that pulmonary metastases occur more frequently with sarcoma, whereas metastases of all other regions are much

more frequently observed in carcinoma than in sarcoma.

The authors report the details and histologic findings of a case in a child of 13 years in which although the symptomatology approximated more to the primary type of pulmonary sarcoma yet autopsy showed it to be a case of pulmonary metastatic sarcoma primitive in the tibia.

W. A. BRENNAN

Landois, F.: Primary Lung Suture of the Front (Die primäre Lungennaht im Felde) *Beitr. z. klin. Chir.* 1916 c, 111

The author discusses the immediate operative treatment in the field hospital of chest or lung wounds which are complicated with open pneumothorax. He operated upon 9 such cases: 2 with open pneumothorax without clinical evidences of lung injury (both died); 5 cases of open pneumothorax with lung tearing (2 deaths); 2 cases of open pneumothorax with injury of the abdominal viscera (1 death). The clinical details of these 9 cases are given.

From the observation of these cases Landois draws these conclusions:

In the case of gunshot lung injuries with open pneumothorax at the front closure of the injury by suture is to be effected immediately.

2. Closure of an open pneumothorax is best effected under high pressure narcosis, entering the projecting lung with circular sutures into the thoracic cavity. The Aner Meltzer high pressure apparatus as modified by Burckhardt is used. This procedure prevents collapse of the lung should infection of the pleural cavity set in causing a total empyema. At the same time any existing rents in the lung should be sutured with fine silk.

3. In the event of combined injuries of the chest and pleural cavity the best method is transdiaphragmatic laparotomy. In cases where the liver has been injured this is the established method.

4. In most cases of open pneumothorax in war a secondary empyema occurs. This is treated by typical rib resection.

W. A. BRENNAN

HEART AND VASCULAR SYSTEM

Domenici L. Separate and Simultaneous Ligation of the Coronary Arteries and Veins of the Heart (*Ligatura separata e simultanea delle arterie e delle vene coronarie del cuore*) *Policlinico Roma* 1916 xliii, sez. chir. 155

Domenici's experimental researches were made on dogs. Anatomically he finds that there is a similarity in the disposition of the coronary vessels in dogs and man. The first parts of the two coronary arteries are not accompanied by veins, the dorsal artery is easily reached but not so with the dorsal. If it is desired to make a compensatory venous ligation after ligating a coronary artery in its first part it is necessary to ligate the great coronary veins in the left auriculoventricular sulcus. The auriculo-

ventricular branch on the left side is isolated at its first part and it can be easily ligated there so that a compensatory ligation of the great coronary vein must be made at this point.

In Domenici's series of more than 50 experiments he has ligated the coronary vessels in dogs, either isolating the principal trunks and the collateral branches of the two coronary arteries and the great coronary vein or contemporaneously ligating the arteries with the corresponding veins. From these experiments his deductions are:

1. Ligation of the superficial ventricular collateral branches of the left coronary is innocuous, causing at most and only in some cases, foci of fatty infiltration.

2. Ligation of the left circumflex is more dangerous as it causes alterations of the myocardium more frequently.

3. Ligation of the descending intraventricular part of the left coronary is still more dangerous because it almost always produces immediate arrest of the heart action.

4. Ligation of the left coronary at its origin always causes stoppage of the heart.

5. Ligation of the right coronary produces less grave and more variable results because in dogs this is always less developed than the left coronary.

6. Ligation of the great coronary vein is innocuous.

7. By contemporaneous ligation of the vein to the arterial vessel (compensatory ligation) the gravity of the effects produced by the ligation of the artery alone is decreased.

The author thinks that these results depend upon the anastomoses between the branches of the coronaries which although diversely developed yet always exist both between the coronaries and the *vasa vasorum* of the aorta and of the pulmonary artery and pericardial vessels, the existence of which is confirmed by the survival for three hours after the ligation of both the coronaries.

The author further believes that immediate stoppage of the heart after occlusion of the artery alone at its origin or along its intraventricular part is due to the disturbances which are produced in the nutrition of the muscular fibers and of the intrinsic ganglionic system as well as to the mechanical obstacle which the strong stasis produced by the ligation must offer to the myocardial function. Compensating ligation by diminishing such venous stasis according to the ideas of the author makes nutrition and the myocardial function possible until a collateral circulation is established and thus lessens the gravity of arterial ligation.

The author has collected from the literature 18 cases of various wounds of the coronary vessels of the heart in man. From an examination of these and from anatomical considerations he believes that the results obtained from the experiments on dogs and the considerations relative to them might with great profit be extended to man.

W. A. BRENNAN.

Skirving, R. S. Shrapnel Wound of Posterior Wall of Pericardium. *Brit J S* 9 1911 96

The author reports a case in which a piece of shrapnel had lodged in the posterior wall of the pericardium at its base, coming under his care about four months after the injury the foreign body having entered the thorax at the posterior axillary line. At this time the patient suffered from shortness of breath on exertion, rapid pulse and a deep-seated pain in the chest.

The X-ray showed a foreign body situated apparently at the upper reflex of the pericardium to the left of the middle line, posteriorly.

The pericardium was exposed through an anterior incision without injury to the pleura, and was opened throughout its extent from above downward. The object was found and about two-thirds of the mass seemed to lie without the pericardium it was cautiously freed from its bed and removed without serious hemorrhage.

The patient made an uneventful recovery, by the tenth day the pulse had fallen to eighty beats per minute and he was perfectly comfortable.

D. L. D. (1911)

PHARYNX AND OESOPHAGUS

Schaldenose, V. Operated Case of Idiopathic Dilatation of the Oesophagus (Operierter Fall von idiopathischer Oesophagusdilatation). *Zr U* *Nord. Surg. Cong. Göttingen* 9 6 July

A man 46 years old complained of a gradually pressing pain and vomiting. He could not lie down without being seized with severe coughing fits, and he lost weight. Heller's operation was performed, mobilization of the left curvature splitting of the peritoneum over the lowest portion of the oesophagus. The oesophagus was then liberated with the finger through the hiatus for a distance of 5 cm. the musculature was divided down to the submucosa one cm. above the cardia and the

peritoneum was closed. The patient is well and has gained 20 pounds in three months.

HANSEN stated that he had performed a gastrostomy in a case of dilatation of the cardia with cure. Shortly after this operation it was shown on the X-ray plate that gravel adhered to the walls of the oesophagus. This disappeared later showing that an anatomical improvement had taken place. Another patient was admitted with a perforated duodenal ulcer which was sutured. A month later a gastro-enterostomy had to be performed for pain and vomiting. Later vomiting again developed but of a new origin with symptoms of cardiospasm. It is probable that this was due to the fact that the patient secretly smoked while in the hospital and swallowed the smoke. Improvement followed bougie treatment.

BACKER GROS DAME reported the case of a 33-year-old woman, who since her sixteenth year had suffered from an increasing grade of vomiting. At 20 she had symptoms of gastric ulcer at 25 haematemesis. The examination showed ptosis and severe retention in the large ventricle as well as cardiospasm. Gastro-enterostomy and gastrostomy were performed. Some immediate improvement followed, later however she was troubled with violent vomiting for five years with a loss of 3 kg. in body weight. After irrigation of the oesophagus and mobilization of the left curvature a plastic Finney operation was performed on the cardia. The patient was at first fed through a jejunostomy opening. The X-ray now shows a good unobstructed passage.

BORCHGREVINK performed Roepeke's operation in one case after mobilization of the left curvature. It was impossible to loosen the oesophagus from the pericardium. It was opened and then sutured. The operation was completed but while the cardia was being tested for patency with a sound a perforation of the oesophagus occurred. The ventricle was sutured to the diaphragm. Death occurred on the fifth day from infection.

L. A. JAMES

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Ligat, D.: Hyperalgesia in Abdominal Diseases; Preliminary Notes on the Diagnostic Value of Maximal Points. (Hyperalgesia of the Skin and Subcutaneous Tissue of the Abdominal Wall in Affections of the Abdominal Viscera. *Proc. III. or Lond.* 1916 xxvii, 66)

Ligat records his observations on the diagnostic value of maximal points of hyperæsthesia of the skin and subcutaneous tissues of the abdominal wall in affections of the abdominal viscera.

He feels that all the pain that a patient complains of and the tenderness that an observer can elicit would seem to be due to a true viscerosensory reflex, and not in any way to pain or tenderness felt in the organ itself. In his investigation he followed

the general lines laid down by Sir James Mackenzie in his *Symptoms and Their Interpretation*, with the result that his observation strikingly confirmed the latter.

He first tried various methods of eliciting reflex responses, but finally adopted that of grasping the skin and subcutaneous tissues firmly between the finger and thumb and drawing them away from the deeper layers of the abdominal wall. If an hyperalgesic area be present the patient winces, and one can tell by the facial expression, when such an area is being stimulated.

The amount of pain varies, usually when there is abundant evidence of acute inflammation the pain produced by pulling is acute. In a considerable number of cases the patient has hardly admitted

that the pinch has caused actual pain the sensation produced being evidently difficult to define but described as curious, unpleasant different from other places etc.

Ligat's observations lead him to locate the hypogastric areas as follows

1 That for the gall bladder is situated where a horizontal line drawn from the tip of the tenth rib crosses a vertical line drawn midway between the nipple line and the middle line of the abdomen

2 The maximum appendix point is situated at the junction of the upper and middle thirds of a line drawn from the umbilicus to the right anterior superior spine. The fallopian tube point of hypæsthesia is at the junction of the lowest and adjacent fourths of a line drawn from the middle of Poupart's ligament to the umbilicus. In gastric or duodenal ulcer he locates the maximum point exactly midway between the ensiform process and the umbilicus

3 That of the small intestine excluding the first part of the duodenum, is situated in the midline of the abdomen not higher than a point at the junction of the lower and middle thirds of a line drawn from the ensiform to the umbilicus or lower than a point at the junction of the upper and middle third of a line drawn from the umbilicus to the symphysis

In regard to the large gut the maximum point is located centrally in the lower half of a line from the umbilicus to the symphysis D. L. DESPARD

Ceballos, A. and Segura, G.: Acute Tuberculous Peritonitis Peritoneal Granulata (Peritonitis tuberculosa aguda Granulata peritoneales) *Rev Assoc med Argent.* 1916 xxv, 50

The case reported by the authors was that of a young girl 16 years old who after a severe attack of epigastric pain followed by bilious vomiting was removed to the hospital in a grave condition.

The symptoms indicated peritonitis. A para-umbilical laparotomy was done the stomach and duodenum being explored but nothing of importance was found. The small intestine showed red coloration and there was some clear serous fluid in the peritoneal cavity. On the loops and mesentery there was a large display of whitish granules especially abundant in the cecum and in the appendix which was free. The parietal and visceral parts of the peritoneum showed the same conditions the granulations displaying preference for the vicinity of the mesenteric vessels. There were no adhesions.

An appendectomy was done and the abdomen closed without drainage. Recovery resulted in twelve days. The result of inoculations made with preparations from the meso-appendix proved that there was a tubercular bacillary process.

The authors are of the opinion that the peritonitis was due to the lesions found and that amelioration was afforded by the opening of the abdomen. Peritoneal granulata has always been considered as an incident of chronic generalized granulata and outside the reach of surgical intervention. Medical

literature offers some cases which resemble this case somewhat but the authors have not been able to find a case exactly analogous in symptomatology to this. W. A. BRENNAN

Cimaroni, A. Modern Treatment of Acute Peritonitis *Internal J Surg.* 1916 xxxv, 243

The modern treatment of acute peritonitis is based on certain definite and practical criteria. The greatest absorbing power of the peritoneum is possessed by the tendinous center of the diaphragmatic portion and the least by the mesenteries and broad ligaments. The mechanism of the currents which carry particles from every direction toward the diaphragm chiefly depends upon movements of that organ insoluble substances passing into the lymphatic tissues of the tendinous diaphragm while soluble substances follow the blood stream and are absorbed more rapidly and from all peritoneal surfaces. Absorption is hindered by abundance of fluid in the organism by venous hyperæmia, and by cold it is facilitated by loss of water or blood by arterial hyperæmia, by heat and by high blood pressure abdominal massage, exercise etc. Bacteria like other insoluble bodies follow the lymphatic route of absorption.

Diffusion of peritoneal sepsis is opposed by mechanical and biological factors. Masses of fibrin, leucocytes endothelial cells, detritus lymphatic thrombi etc. block the peritoneal fissures and constitute a first line of defense beyond which there is another line represented by lymph-glands. Examination of peritoneal exudate has shown an increased number of macro- and microphages in increased bactericidal and antitoxic action and proteolytic properties.

These findings suggest the following steps: timely intervention, rapid removal of the cause, drainage in the most dependent part of the abdomen, no manipulation and no lavage, Fowler's position, and proctoclysis.

Early laparotomy is of the greatest importance in facilitating precision of technique while incision over the point of the causative lesion obviates manipulation. In peritonitis originating in the viscera of the lower half of the abdominal cavity McBurney's incision is suggested in that produced by lesions in the upper half the incision of election is across the right rectus, thus permitting examination of the stomach pylorus, duodenum and gall bladder.

While many believe that drainage is injurious if done carefully it may accomplish its purpose with out injury facilitating the removal of purulent exudate collected in the most dependent parts near the point of origin of the peritonitis.

Many authors consider the action of drainage ineffective and therefore they close the peritoneum completely. Granting that tamponade and drainage have only a transitory beneficial effect, yet during this time a large part of the fluid which would otherwise remain in the abdomen can be voided and

Davis, L.: Complications and Sequelæ of the Operation for Inguinal Hernia. An Analysis of One Thousand and Five Hundred Cases at the Massachusetts General Hospital. *J Am M Ass* 1916 lxvii, 480.

Coley reports 3100 cases of inguinal hernia with less than one per cent recurrence and among 383 cases of hernia of all kinds there was a mortality of 0.17 per cent. The author's analysis is based upon 1500 consecutive cases of inguinal hernia operated upon at the Massachusetts General Hospital from October 1903 to December 1914. Definitely strangulated hernias were not included but cases of incarceration without acute symptoms were counted. These operations were performed by no less than seventy-five individual operators. There were 1,388 males and 112 females. In 1,244 cases the hernia affected one side only, in 56 it was double. In 88 cases the hernia was direct and in the others indirect. In 69 cases the hernia was complicated by undescended testicle. There were 9 cases in which the bladder was contained in the sac. The appendix was found in the sac in 8 cases and was removed in the course of the operations in 46 cases. There were cases of sliding hernia. Hydrocele was present in 40 cases. In 50 cases there had been a previous operation for hernia, with recurrence. In the male cases the Bassini technique was employed 834 times, Ferguson 764 and Halstead 15. In 16 cases in which the hernia was complicated by ectopic testicle, orchidectomy was performed. In 50 cases the undescended testicle was brought down into the scrotum in one case it was dropped back into the peritoneal cavity. In 9 cases orchidectomy was done in the course of the operation on account of tuberculosis, gumma, or other lesions of the testicle.

Spinal anesthesia was used in 89 cases. Local anesthesia was used alone in 75 cases. There was one case of rectal anesthesia. The bladder was injured in 2 cases, with immediate suture without ill effect. The vas deferens was reported as cut 7 times. There were 8 deaths in the series, a mortality of 0.53 per cent.

The author reports an unusual case with death, a man of 63 with diabetes mellitus having a scrotal hernia and symptoms of severe cystitis. Under spinal anesthesia a suprapubic cystotomy was done. It was then found that there was a hernia of the bladder through the inguinal canal. As the bladder could not be withdrawn through the hernial opening the inguinal canal was opened and a stone was found in the portion of the bladder lying in the hernial sac. The stone was removed, the inguinal canal repaired, and the bladder closed about a suprapubic drain. The patient died of sepsis. Non-fatal post-operative complications of more or less severity developed in 438 cases, or 28 per cent. Some of these were trivial. In many cases the complications were multiple.

In 158 cases the wounds failed to heal by first intention. In 93 cases the sepsis was trivial, con-

sisting either of a stitch abscess or more often a collection of serum which required draining. In many of the latter cases probably no infection was present, cultures were not made. In 65 cases there was frank pus in the wound, under 4 per cent of the total number of wounds. Of the 75 cases in which operation was performed with local anesthesia, sepsis developed in the wounds in 13 cases, or 17 per cent. Of the 89 cases in which operation was performed with spinal anesthesia there were 9 septic wounds or 10 per cent. Hematoma developed in 112 cases. Complications in the respiratory tract occurred in 138 cases, 9.2 per cent. Data subsequent to discharge were obtained in over 50 per cent of the cases. During the year 11 patients died of intercurrent disease, 577 were reported unequivocally well or cured, representing 6 per cent whose subsequent history was known.

The commonest complaint was of pain in the wound, especially when working or lifting. Two complained of persistent numbness in the inguinal region. Of the others in the relieved class, 17 patients had no actual recurrence of hernia but a bulge in the region of the scar, 8 had marked varicocele, 5 were cured of the hernia for which they were operated on, but subsequently developed hernia elsewhere, 3 had atrophy of the testicle, 2 had keloid in the scar, 1 had a persistent sinus, 1 developed adenocarcinoma of the sigmoid, and 1 was cured of hernia but had incontinence of urine. There were 6 cases of miscellaneous and unclassified complaints.

Fifty-nine patients had definite recurrence within the year, 5 of these had double recurrences, 2 are known to have recurred after the lapse of a year, making a total of 69 recurrences, or 3.7 per cent of the total number of operations performed, and 8 per cent of the number of cases traced. There were 6 cases in which there was questionable recurrence. In 1 of these, relapse was claimed by the patient but could not be found by the examiner. If these 6 cases are counted as recurrences, the percentage is raised to 9 per cent of the cases traced. Of these recurrences, 26, or 3.1 per cent, followed the Bassini operations, and 34, or 4.4 per cent, the Ferguson. In 112 cases in females there were only 2 recurrences. Of the 88 direct hernias there were recurrences noted in 7, or 7.9 per cent, or 15 per cent of the direct hernia cases traced.

The author concludes that postoperative cough, hematoma, and sepsis are important factors in the incidence of recurrence, but the latter complication seems to play a lesser rôle than is generally assigned to it. A strikingly large number of patients anatomically cured complain of pain, probably due to nerve traumatism.

C. G. HERTZ

Lithotomy W. L.: Lipiectomy and Umbilical Hernia. *J Am M Ass*, 1916 lxvii, 487.

Umbilical hernia is about twelve times more common in women than in men. In doing a lipiectomy the abdomen is seized above and below and a large

amount of tissue can be raised between the hands, which when brought together will give an idea of how much should be removed. The incision is elliptical, beginning well over on the side and extending to the corresponding point opposite while its center below is a few inches above the pubis, and the upper above the umbilicus. It should extend to the fascia and then the whole amount of tissue in the area should be removed. The closure is easy and should be done with deep catgut sutures, reinforced with silk worm gut. The after treatment if hernia has been repaired, is rest in bed for from eighteen to twenty five days; a semisitting posture is usually best. If a lipectomy alone is done, then a recumbent position for eight or ten days, followed by the use of a back rest for a few days is all that is necessary.

There is a class of cases in which a small lipectomy is most helpful in operating on stout patients in whom the thick wall of fat increases the distance from the surface to the parts to be reached, compelling the operator to work in a deep space with a wall of fat on each side. Accurate suturing is very difficult in some of these cases by reason of this condition, and Kelly has made a valuable suggestion by which the difficulties are overcome in a large measure by an oval incision of skin and fat down to the internal abdominal wall, removing the section either transversely or in a vertical direction, corresponding to or at right angles with the deeper incision. This removes the thickness of wall down to the fascia, and from there into the abdominal cavity the depth is not great and the opening and closing is made comparatively easy while final closure of the skin is not difficult. This also reduces the fat somewhat though of course much less than in a regular planned excision or lipectomy.

C G Hervo

GASTRO-INTESTINAL TRACT

Ginsburg, H., Tumpowsky I., and Hamburger W. W. The Newer Interpretation of the Gastric Pain in Chronic Ulcer. *J Am M Ass* 9 6 April, 1904.

The precise nature of the characteristic pain of peptic ulcer is a matter of considerable dispute, and the authors endeavor to throw some new light on the subject.

Although several investigators (Herty Carlson, Lennander) have claimed that the normal gastric mucosa can not give rise to painful sensations and that the viscera are not supplied with pain nerves, latter evidence (Kast and Meltzer) tends to show that painful sensations do arise from the viscera although in diminished quantities and that the stomach has pain nerves.

In normal stomachs injection of weak acids causes no pain (Lowenthal, Hertz Cook, Schmidt). In ulcer cases, the most varied results are reported some reporting pain from 0.3 per cent hydrochloric acid and others no pain from 5 per cent hydrochloric acid in cases where ulcers were found at

operation. Therefore it is safe to conclude that acidity alone can not cause pain.

The latest theory of the cause of pain is sudden increase in intragastric tension (Hertz) probably due to exaggerated peristalsis in the hypertonic organ. Moynihan believes this is brought on by chemical factors. Edelman and Duochesi have found that hydrochloric acid stimulates peristalsis. Hertz, however, believes that excess acid passing into the duodenum prevents relaxation of the pylorus or that the ulcer exposes more nerve-endings in the stomach wall the irritant of which by acids etc., causes pyloric spasm and intensified gastric tonus. The authors are inclined to this view.

Hunger experiments have shown this to be due to contractions not only that is by stimulation of the nerves in the muscularis. Rolinoff found that the whole alimentary tract had a periodic activity when not digesting the periods occurring every hour and a half to two hours. Cannon and Washburn further found that the strong contractions of the stomach were invariably accompanied by the sensation of the hunger pang. This sensation disappeared when the contractions ceased.

The authors believe that the hunger contractions have a direct bearing on the pain in ulcer and that there is a close analogy between the state of hunger and the more plausible view that ulcer pain is due to tension.

A series of experiments on 3 cases was instituted with this in view. Detailed report of one case being given. In all cases with the onset of strong contractions the patient complained of symptoms varying from a feeling of fullness to severe epigastric pain, the sensations coming on when the contractions reached their height. Administration of hydrochloric acid in strengths of 0.3 and 1 per cent caused little or no effect. Stronger solutions, however, caused vigorous contractions. In one case inhalation of amyl nitrite caused an immediate cessation of all contraction for four hours, accompanied by a feeling of extreme faintness. In another case, the injection of 15 minims of pituitary extract caused vigorous contractions to set in.

The author's conclusions are as follows:

1. The finding of strong contractions of the stomach accompanying the pain of gastric ulcer seems to confirm the idea that pain is due to tension.

2. The marked hunger contractions cause pain in a hypermimable condition of the stomach by increasing intragastric pressure.

3. The conception that gastric pain is due to tension will explain many obscure conditions simulating gastric ulcer viz. achylia gastrica, chronic appendicitis, and gall-bladder disease.

4. Hyperacidity alone may be a factor by reflexly causing hypertonus hyperperistalsis, and pylorospasm, allowing greater tension to be produced.

5. The subjective relief of pain by alkalis does not necessarily prove that acid is the cause of pain, but may be interpreted on the basis that alkalis

prevent the development of pain producing hyper-tonus by neutralizing the causative factor of such hypertonus i.e. pain.

6 Hydrochloric acid in the strength that it may occur in the stomach, about 0.5 per cent. causes no appreciable effect.

P. M. CHASE.

Nuxum, T. W. Gastric and Duodenal Ulcer in the Newborn. *W. J. M. J.* 1916 XV 111

From a consideration of two cases of his own and of several others in the literature the author concludes that ulcer of the stomach and duodenum occur in the child *in utero* being undoubtedly of thrombotic origin, the bacteria originating in the mother and passing through the placental circulation. In the one case which came to post-mortem, there was no induration of the edge of the ulcer but there was a band of adhesion extending to the gall-bladder showing that the ulcer must have existed for some time.

No symptoms are visible until loss of blood becomes manifest either through vomiting or its passage in the stool or by pallor or collapse from loss of blood. The treatment is that for arrest of hemorrhage.

E. K. ARMSTRONG.

Baetjer F. H., and Freidenwald J.: The Value of Roentgen Ray Examinations in the Diagnosis of Cancer of the Stomach. *Bull. Johns Hopkins Hosp.* 1916 XXVII, 221

The early diagnosis of cancer of the stomach is often very difficult. The X ray method of diagnosis is probably more correct than any other means now in use. The findings however should always be taken in conjunction with the clinical findings before making a final diagnosis.

From the fact that the normal stomach varies in size, shape, position, and the length of time in which it empties none of these factors can be considered in making a diagnosis of cancer.

The diagnosis rests upon changes in the peristalsis and irregular filling defects of the organ itself.

In cancer of the cardia, the cardiac orifice is usually interfered with and there is a small or large filling defect near. There is usually no interruption of peristalsis.

In lesions of the body of the stomach there is a persistent filling defect and at this location peristaltic waves are interrupted due to induration of the stomach walls at this point.

There are two types of carcinoma at the pylorus the annular type and the invasive type. The annular type produces obstruction early the pylorus is thickened and lengthened and depressed in the center forming a crater.

In the invasive type there is a persistent filling defect at or close to the pylorus and this area is free from peristalsis since the waves pass over the area and are lost. This type of cancer may exist for some time without obstruction. When obstruction is present there is a bulging of the pyloric end

of the stomach on the greater curvature due to pressure of stomach contents against this point.

Spasm of the stomach will sometimes cause persistent filling defects. Full doses of atropine for one or two days will cause a relaxation of the spasm.

In the differential diagnosis between benign ulceration and cancer the following points should be considered

1 In cancer unless the pylorus is involved there is hyperperistalsis and rapid emptying. In ulcer there is hyperperistalsis with pylorospasm and slow emptying.

2 Cancer may occur in any part of the stomach. Ulcer usually occurs on the lesser curvature near the pylorus.

3 In cancer the lesion is surrounded by a large invaded area, which is free from peristalsis. In ulcer this invaded area is much smaller or absent.

In early cancer it is often impossible to determine whether the ulceration is benign or malignant. In late stages where the growth is large the differential diagnosis is usually simple.

In regard to negative diagnosis if it can be demonstrated that there are no defects in the stomach wall that peristalsis is normal and that there is no tendency to obstruction cancer can be ruled out. Of 50 consecutive cases of cancer of the stomach examined by the authors the lesion was found in all the cases but in 5 per cent of the cases it was thought to be benign and found at operation to be malignant.

G. W. GERR.

Fortunet D. de and Cade, A.: A Case of Gastric Cancer with Secondary Cerebellar Involvement and Terminal Meningitic Complications (Sur un cas de cancer gastrique avec noyau secondaire cérébelleux et accidents méningitiques terminaux). *Progrès Méd.* 1916 p. 132

Encephalic complications arising from gastric neoplasms are far from common. The author has had occasion to observe such a case in its final stages and under circumstances which rendered diagnosis difficult. The patient was a man of 31 who arrived at the hospital in a very bad condition. A hard irregular tumor could be palpated extending from under the costal border to the level of the umbilicus. The general state as well as the size of the tumor contra indicated surgical intervention. On the second day after entering the hospital the patient showed mental disturbances and parietic phenomena appeared in the lower right limb. On the following day all four limbs showed marked paresis. He died in coma on the fifth day.

Autopsy showed a neoplasm of the posterior wall of the stomach with submucous infiltration extending to the pancreas with extensive lymphatic generalization and with a secondary manifestation situated superficially at the lower part of the left cerebellar lobe. There was a purulent meningeal exudate. The patient's history showed that there had been gastric troubles for five or six years before.

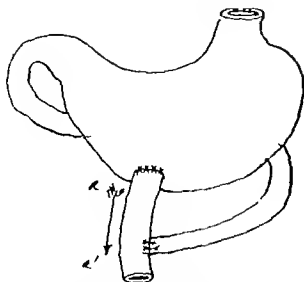


Fig. (Goyanes)

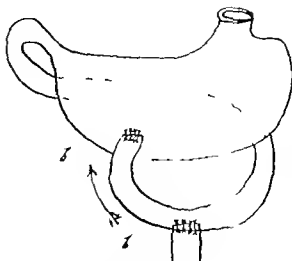


Fig. 2 (Goyanes.)

The nervous phenomena could only be attributed to a meningeal encephalic generalization.

Examination of the cephalorachidian fluid showed numerous cellular elements (polynuclears, lymphocytes, endothelial cells, and irregular degenerate giant cells), which were considered to be of neoplastic origin.

Histological examination of various sections from different generalizations showed that they undoubtedly had their origin from the gastric neoplasm.

W. A. BRYMAN

Goyanes, I. A Modification of Roux Gastro-Enterostomy in T. Gastro-Enterostomy in T (Una modificación al procedimiento gastroenterostomía en Y de Roux gastro-enterostomía en T) *Siglo med.* 19 6 1911 3

Goyanes points out certain inconveniences in Roux' gastro-enterostomy which in his practice has led him to make a modification. This modification will be understood from the rough figures. Fig. 1 represents the scheme of a Roux operation, in which the intestinal segment *aa* is plainly seen between the two anastomoses — gastro-enteric and entero-enteric. The contractions of this intestinal portion are normally descendant and consequently favor evacuation of the stomach perhaps with exceeding rapidity. Fig. 2 represents the author's procedure of gastro-enterostomy in T which reduces simply to implantation of the proximal end of the jejunum in the stomach at its lowest point and then suturing the distal end to this jejunal loop at its lowest point.

By this method the intestinal segment *bb* is placed in an antiperistaltic condition, that is, the waves run upward and its contractions restrain hasty gastric evacuation i.e. it acts like a neofunctional pyloric sphincter and its greater or lesser efficiency will depend on its length.

W. A. BRYMAN

Coffe, G. W. Methods and Results in Surgery of the Stomach and Intestine. *Buffalo M. J.* 9 6 1911, 55

The principal cause of the former high mortality in resections of the stomach and intestines was acidosis the reserve alkalinity of the body having been lessened often reduced to a minimum. In these cases measures should be employed which will obviate further depletion of the already lessened store of alkalies and bases in the body and if possible the reserve alkalinity should be increased. As surgical trauma diminishes reserve alkalinity the former should be reduced to a minimum by the employment of the technique of anodi-association while nitrous oxide is the anesthetic of choice because of its conserving action.

In resection the operation should be performed in two stages (1) gastrojejunostomy (2) resection after the restoration of nutritional balance. Aside from protection against threatened acidosis, great advantage is found in cases of doubtful differentiation between cancer and ulcer. Division of the stomach by the cautery and searing of the cut edges with moderate heat sterilizes against pyogenic infection and cancer growth and prevents bleeding, three important considerations.

In both the first and second stages the patient is treated as though acidosis were impending by the administration of water and subcutaneous saline infusions glucose and soda bicarbonate per rectum, and by the induction of sleep through the administration of bromides per rectum, as it is only during sleep that the lesions caused by acidosis can be repaired.

E. K. ARMSTRONG.

Weeks, A. Congenital Pyloric Stenosis. *Calif. J. Med.* 9 6 1911 57

The author reports two cases of congenital pyloric stenosis and offers the following conclusions

1 Congenital pyloric stenosis must be diagnosed early

2 It must be relieved by operation.

3 The operation known as Rammstedt's is by far the best, as it is the simplest, quickest and safest

4 A pediatrician should work with the surgeon in order that the baby may be properly watched and fed

5 Babies said to have recovered from this condition medically were improperly diagnosed as the tumor could not have been present.

6 The anesthetist should be the best it is possible to secure.

Pauchet, V. Radical Cure of Cancer of the Pylorus
(Cure radicale du cancer du pylore) *Presse méd*
1916 p 361

Pauchet says that on making an exploratory laparotomy the cancerous pyloric mass is sometimes observed to be mobile and with few adhesions. In such a case pylorotomy should be done without hesitation. When the pyloric mass is adherent to the liver or other neighboring organs some operators prefer to make a gastro-enterostomy while others including the author prefer a pyloric resection. Even if it be only a palliative operation the results are much better since the patients often survive a year or more instead of only a few months. When such intervention is practiced in advanced cases there is always the risk of having to remove the colon, liver, etc. and the mortality of these very mutilating procedures runs to 25 or 30 per cent, yet the greater operative risk is worth while as it gives the patient the chance of living longer.

There are five indispensable preparatory measures before and after operations: (1) to assure evacuation of the colon by successive lavage; (2) stomach lavage (oxygenated water); (3) cleansing of the teeth before and after operation; removal of tartar and application of iodine tincture to the gums; (4) to see that the patient drinks only sterile fluids in sterile receptacles during the eight days preceding operation and the eight days following it; (5) to train the patient in respiratory gymnastics which will prevent hypostatic congestion of the lungs.

The author employs regional anesthesia preferentially to avoid pulmonary complications. The operative technique employed consists of the following measures.

1 Median laparotomy. In this the incision must be very much increased for the radical operation. The transverse colon must be separated from the great epiploon and pushed out of the way while the pylorus, the tumor and the great epiploon are removed. The cancerous pylorus is separated from the pancreas and mesocolon.

2 Ligature of the vessels and section of duodenum. In sectioning the duodenum the treatment of the stump is consolidated by the suture of a fragment of epiploon. This consolidation will prevent a secondary rupture of the duodenal suture and guarantee against a duodenal fistula.

3 Ligature of the gastric vessels and section of the stomach. The section of the pyloric portion of the stomach is done by thermocautery.

4 Implantation of the gastric stump in the jejunum is made about 15 cm from the duodeno-jejunal angle. If the gastric section is very long it can be narrowed down by some sutures.

5 Treatment of head of pancreas. This is covered with epiploon, sutured with catgut and not drained.

6 Closure of the abdomen completes the operation.

Radiologic examination of such operated patient shows that while the stomach surface is reduced to one third of the normal despite the enormous anastomatic opening the functioning is fulfilled as in a normal stomach. W. A. BRENNAN

Escudero P. and Pasman R.: Decapitation of the Duodenum by Ulcer (Decapitación del duodeno por úlcera) *Presse méd* Argent. 1916 III, 47

The authors call attention to the rarity of this case, there being only one analogous case published. The patient was a man of 60 whose symptoms suggested a diagnosis of duodenal stenosis which after further radiologic examination was definitely changed to penetrating ulcer. During the operation which followed lesions of the retractile meso-enteric type were met with. The anterior wall of the stomach was found infiltrated. The small curvature, the liver, biliary vesicle, and duodenum were all intimately adherent. Posterior gastro-enterostomy was done. Postoperative evolution began well. Micturition disturbance and urinary infection arising from an old urethral affection necessitated an urethrotomy. The patient failed rapidly and died on the eleventh day.

Autopsy showed a cavity the size of a mandarin orange between the adherent organs mentioned above. There was a veritable section of the duodenum as clear as if cut by shears. This cavity was empty. In the other analogous case which was reported by Meunier the cavity contained food remnants. W. A. BRENNAN

Saralegui J. A.: Radiologic Study in Some Cases of Intestinal Obstruction (Estudio radiológico en algunos casos de obstrucción intestinal) *Rev*
4100 *méd* Argent. 1916 III, 86

The diagnosis of intestinal obstruction is generally easy under the radioscopic screen when there are no complications requiring clinical aid. Whenever the author is sure of the permeability of the pylorus and that there is no other lesion whatever that detains the ingesta in the stomach he is convinced that there is an obstruction in the small intestine if nine hours after a meal remnants are still in the stomach.

Some particulars are given of the radiologic findings in different types of obstruction. In chronic invagination of the small intestine there is usually an absolute failure of the projection of the cecum on the screen. The projection of the shadow is

different according as the obstruction is complete or not. In the first case we do not see the residue of the bismuth meal diminish in bulk when examinations are made at the end of 1, 2, 3 or 36 hours and in the second we see the small intestine in its last part displaying a thread of bismuth marking the reduced trajectory left by the invagination. In chronic or subacute appendicitis there is frequently obstruction of the latter part of the ileum rendered visible at such times by intestinal ectasia.

When caseous or fibrocaseous peritoneal tuberculos is a cause of intestinal obstruction an ectasia of the bismuth is produced at the height where a constricting band or the bacillary process obstructs the lumen of the intestine. Clinically this is usually about the last portion of the ileum which is most frequently the site of this lesion.

In obstruction due to a Lane's kink, the diagnosis by the screen is based on the ectasia of the bismuth, with displacement of the caecum downward and to the right side.

When the ectasia is produced at the level of the caecum the diagnosis is not always easy as there are other affections besides intestinal obstructions which are capable of showing the same symptomatology at this point (caecum mobile, etc.).

W. A. BRENNAN

Gallie, W. E. Intussusception. *Canad J M & S* 1915, 21, 38.

Gallie gives a statistical review of 45 cases of intussusception in small children, occurring in the Children's Hospital of Toronto.

In the series 17 cases were irreducible. 15 of these were treated by resection and anastomosis and 2 by simple ileostomy. All died. Twenty-eight cases were reducible. 3 were reduced without operation and all recovered. Of the 25 cases 18 were easily reduced and 14 recovered. 10 were reduced with difficulty and only 2 recovered. Gallie terms them "easily reduced" when there is no sign of localized peritonitis, no marked oedema, no infection of ensheathing layer or other signs of injury. The prognosis will then depend on the presence or absence of these factors.

The causes of death are shock and toxæmia. In the 29 fatal cases, 13 died of shock of these 13 had resections done. Of the 16 dying from toxæmia, 3 died of peritonitis five days after operation, the other 14 showed typical symptoms of toxæmia of intestinal obstruction, i.e. temperature gradually rises, blood pressure falls, and unconsciousness supervenes. Whipple has shown this toxin to be a protease formed in the mucosa above the obstruction and that the longer the obstruction persists and the more extensive the damage to the intestinal wall, the greater the probability of a toxæmia. Gallie advocates the use of a long rubber catheter passed through the rectum, along the colon into the ileum above the seat of obstruction to afford drainage of the toxin.

The probability of recovery is in inverse ratio to

the length of time intervening between the onset of symptoms and the institution of treatment. Of the 16 recoveries, 12 received treatment within twenty-four hours of the 29 fatal cases, 24 did not receive treatment until after twenty-four hours. Further the longer the interval, the greater the probability of the invagination being irreducible and gangrenous. However, several instances are cited as exceptions to the rule which demonstrate that the condition of the bowel cannot always be foretold from the history and general reaction of the case.

In early diagnosis lies the only hope of improvement in the statistics. The condition occurs in healthy children of under one year preceded usually by digestive disturbances. The attack begins with acute abdominal pain and often vomiting followed shortly by the typical stool consisting of merely blood stained mucus and no feces or gas. On examination the abdomen is flaccid and usually the sausage-shaped tumor can be found, in 3 of the series, however no tumor was felt. With these symptoms no delay should occur to allow of palliative treatment.

The rational course is immediate laparotomy and reduction if possible. The operation should be of the shortest possible duration and with the smallest amount of intestinal manipulation or exposure. Intravenous transfusion of 100 to 200 ccm. of normal saline solution is used during operation and 100 ccm. are introduced into the abdominal cavity upon closure. Following operation, hypodermoclysis should be employed to maintain the supply of fluids.

P. M. CHASE.

Melsener Volvulus with Strangulated Intestine; Peristent Ductus Omphalo-entericus (Volvulus mit Strangulationsileus perispermender Ductus omphalo-entericus). *Beit z. N. Chir* 916 cit. 205.

In a case reported by Melsener the patient had symptoms which suggested appendicitis. The diagnosis, however, was very doubtful and the patient was put to bed and treated by fomentations. An enema gave a good stool. Within a day or so, however the situation suddenly changed. The temperature rose to 36.2 pulse, 60. The patient began to vomit and this continued with evident feces in the vomit. The diagnosis was ileus and operation was advised. On opening the abdomen the ascending colon and caecum were found displaced and part of the colon was ballooned up toward the umbilicus and so much swollen that it was ready to burst. Moreover it was twisted on its axis for about 180° and tightly encompassed by a cord which restricted it and passed on toward the umbilicus. Ligatures were applied and the swollen mass resected for about 5 cm. when the rest partly subsided. Vomiting continued during the operation, which had to be abandoned owing to the difficulties. The patient became rapidly cyanotic and died of heart failure four hours after the operation. Autopsy showed that the cord passing around the intestine

was the remnant of a persistent ductus omphalo-entericus which was not in communication with the intestine.

In commenting on this case Meissner states his belief that the abnormally developed mesentery of the first part of the colon gave rise to the volvulus in this section of the intestine. The persistent ductus omphalo-entericus caused the strangulation and as more blood and excrement became clogged up in the intestine the strangulation became narrower. This of itself caused a further increase of stasis which was extended to the lower loops of the small intestine.

A spontaneous reduction of the volvulus was not possible and when an attempt was made to rectify the condition by operation the heart failed death resulting. The question arises in this case whether operation was indicated immediately upon the first signs of vomiting. In view of the fact that shortly before this there was a free passage of the bowels and also that the general condition and pulse were good the diagnosis being still uncertain, Meissner had up to this time refrained from operative interference.

With regard to the clinical aspects of this case in a pathologic anatomical sense it is very interesting not only because of the volvulus and free mesentery of the ascending colon and because of the ductus omphalo-entericus itself but particularly because of the anatomical condition of the communication of this ductus. This condition is peculiar and rare. Persistent ductus omphalo-entericus is of itself no rarity but that the site of communication with the intestine should become obliterated and membranous is a rarity. As a general rule it happens that the ductus when persistent becomes enlarged where it joins the intestine and communicates into a Meckel's diverticulum. This did not happen in this case, but rather the opposite. There was complete obliteration of the lumen against the scarred and shrunken intestine. Moreover although ordinarily a Meckel's diverticulum represents the remnant of the embryonal condition in this case the ductus remained its communications with the navel and intestine having become cicatrized.

W. A. BREYER

Eastman J. R. Congenital Deformation and Dysfunction of the Caudal Ileum and Colon. *J Am Med Ass* 1916 LVII, 647

Owing to irregularities in the fusion of the meso-colon descendens to the mural peritoneum transverse folds or septa are developed and small paracolic fossae are formed. At the lowest level of normal fusion, that is at the proximal or cephalad end of the sigmoid a distinct band, marking the edge or lower border of the fusion tethers the sigmoid to the abdominal wall. This bandlike margin is the linea terminalis, which stands out conspicuously when the sigmoid is drawn ventrally giving added depth to the recessus intersigmoides.

A similar fusion of the outer lamina of what is at

first a free and loose mesentery of the ascending colon with the contiguous mural peritoneum also takes place on the right side. Excess of this fusion gives rise to the condition noted but not explained by Byron Robinson and observed with great frequency since the condition in which a longitudinal plica of peritoneum seems to have been pulled up from the bottom of the paracolic trough and fused like a patch on the lateral surface of the colon sometimes as high as the *tenia libera* or median longitudinal band. Inequalities of normal fusion on the right side give rise to transverse bands or folds dividing the paracolic space into fossae as on the left side. Such transverse folds are so constant as to be considered anatomic.

Frommer Curachmann and Concetti recognize in the elongated sagging redundant sigmoid a persistence of the fetal and infantile condition in which the mesentery is broad and free and this portion of the large intestine relatively long.

There is another important embryologic factor in the etiology of sigmoidal stagnation this being the presence in the fetal and postnatal abdomen of a fold of peritoneum extending from the mesentery of the proximal sigmoid downward and outward in the direction of the internal abdominal ring. This persisting fold takes the same course as the plica vascularis of the descending testis or ovary. Perhaps the postnatal fold on the right side of the abdomen extending from the mesentery of the terminal ileum to the genital gland, which has been called the ileopelvic band by Lane and which in the female may by traction on the appendix be drawn up as the appendiculo-ovarian ligament is but a remnant of the very conspicuous fetal fold of peritoneum which is drawn out by traction of the inguinal ligament on the descending genital gland the inguinal ligament becoming in the male the gubernaculum testis and in the female the round ligament.

No doubt the principal factor in the arrest of intestinal contents in the sigmoid is an anatomic one. In many individuals particularly in the newborn, the sigmoid begins with a sharp turn upward or obliquely to the right and upward from the linea terminalis. Frequently there are other sharp angulations as in the letter M sigmoid rather common in the foetus and adult. Occasionally a sharp curve is seen at the third sacral vertebra where the sigmoid goes over into the rectum.

Stasis of excrement in the sigmoid beyond physiologic limits leads to colitis in this part of the large intestine. Ulceration may appear as the result of long retention of colon contents. Inflammation of the mucous membrane is a natural result of stagnation of bowel contents. The serosa reacts to the irritation of high-grade localized distention a condition which may be called colitis infiltrativa chronica is established fixation adhesions of the sigmoid peritoneum are almost constant sequelae.

On liberation of the sigmoid from the restraint of such irregularities of fetal fusion the return of more nearly normal function is evidenced frequently

by the passing of flatus, and if the deformities of the sigmoid thus induced are not associated with deforming and obstructing intestinal lesions elsewhere, the prospect of relief of stasis may become good as the result of a very simple measure.

Another common site of deforming defunctionalizing adhesions is about the cecum and terminal ileum. Up to the fourth month of embryonic life, this, like other parts of the large intestine hangs by an ample mesocolon. Subsequently however this mobility becomes lost owing to the fusion between the outer lamina of the mesocolon and the neighboring mural peritoneum.

Instances of retrocecal and retroperitoneal appendix may be explained rationally by assuming that before fusion occurs the appendix becomes caught between the coalescing peritoneal surfaces of the cecal mesentery and the abdominal wall.

Faecal fusion bands and membranes as a rule show no signs of inflammation are apparently almost bloodless and have the appearance of thin connective tissue. The diaphanous membrane of pericolic or perityphlitic is characterized by abundant somewhat parallel coursing vessels which it should be noted correspond in their course, division, and distribution with the branches of the ileocolic artery. This vascular web of apparently detached peritoneum cannot often ever be completely removed without leaving a raw bleeding surface. This is obviously an affair of prenatal or postnatal hyperemia, congestion and inflammation a reaction of the peritoneum to irritation often beginning in an inflamed mucous membrane of the appendix or cecum.

It is rare that a chronic appendicitis is not associated with this pericolic membranous vasculosa. The vascular web of membranous pericolicity may hamper peristalsis and occasionally may deform or dislocate the appendix vermiformis and interfere with its drainage but by virtue of its loose disposition over the peritoneal surfaces, it being the hyperemic tunica serosa itself it is not so often found as a deforming factor as is the fold or band resulting from accidents of faecal peritoneal fusion. The vascular coat of membranous pericolicity cannot be removed the excesses of fusion can be broken down by gauze and scissors—spreading dissection and, being almost avascular, they do not readily reform. To attempt to strip off the vascular membrane of membranous pericolicity results in new adhesion formation, whereas the division of the white fusion bands often serves an excellent purpose in releasing the tethered segment of intestine and does not leave behind bleeding surfaces to unite in fresh adhesions.

C. G. HERR.

Guthrie, D.: Prevention of Faecal Fistula in Suppurative Appendicitis. *Proc. M. J.* 96:11, 833.

As a means of preventing faecal fistula in suppurative appendicitis the author considers the following factors of importance:

1. The use of the muscle-splitting or McBurney incision which he says will give a better post-operative wound, especially if sloughing should occur. There will not be as much gaping and this method will not allow as much of the cecum to become adherent to the edges of the wound, as protrusion of the cecum through the wound may cause a faecal fistula.

2. The treatment of the stump of the appendix, whenever possible inverting the stump and using an absorbable purse-string suture of catgut, always ligating the appendix with catgut. A second purse-string suture or a few interrupted sutures of catgut are used for reinforcement. In cases in which perityphlitic is present to a marked degree and the head of the cecum has become so thickened by inflammation that inversion of the stump is impossible he advises turning down a fold of thickened peritoneal coat, ligating the stump with catgut and then covering it over with the cuff tied by catgut.

3. As to the question of drainage soft rubber tubes are used and those of large caliber. They are placed as far as possible away from the head of the cecum are shortened early and removed in about seven days, laxatives being given meanwhile.

In 853 abdominal cases in which drainage was used the author mentions three cases in which faecal fistula developed, one following a pyrosalpinx operation which healed spontaneously, another in the drainage of a large appendiceal abscess which also healed spontaneously, and a third in a case of ruptured appendicitis with general peritonitis, which required an operation to close it. In this third case he is of the opinion that because of the necessity of gastric lavage every three hours for four days, the trauma to the head of the cecum by the tubes was a factor in the production of the fistula.

W. D. PARRISH.

Brock, G. W.: A Simple Technique for Resection of the Prolapsed Rectum. *Surg. Gynec. & Obst.* 96:11, 835.

The author describes a modified Mikulicz operation for resection of the rectum in which the operation is performed over a proctoscope or round bullet of wood introduced through the lumen of the prolapsed mass. The gut and the supporting core within are held in position by tying a piece of rubber tubing or kangaroo tendon around the neck of the prolapse just outside the anal margin.

This technique facilitates handling of the tissues with a gain in rapidly the sutures are easily placed and make an accurate approximation of the bowel, while hemorrhage is constantly under control.

Brown, J. Y.: The Superiority of the Right Side Anus in the Handling of Partial and Complete Obstruction of the Lower Colon and Sigmoid in Cases Unsuited for Radical Operation. *J. Am. M. Ass.* 96:11, 486.

The author has selected the right side for artificial anus for the following reasons: (1) It can be rapidly

made (2) It admits of immediate and proper drainage of the distended bowel above the obstruction. (3) It completely excludes the large bowel (4) Subsequent reconstruction of bowel continuity can be most readily performed. There is comparatively no odor to the discharge from a right-sided anus.

The technique of the operation is as follows. Prior to giving the anæsthetic, the stomach is washed until the water comes back clear. Under ether or gas incision is made through the outer border of the right rectus muscle. The cæcum is located and the small bowel is pulled up clamped and cut across two or three inches above the ileocecal valve. One half of a Murphy button is fitted in a good sized rubber tube. This is inserted and purse-stringed in the proximal intestine. A tube of the same size is next inserted into the distal ileum and through the ileocecal valve. This is held in position by a purse-string suture. Both the proximal and distal ends of the intestine are brought out and fixed at the lower angle of the incision. The wound is closed in the usual manner. The protruding bowel and tubes are carefully surrounded by gauze and the stomach is again washed out before the patient leaves the table. The tube through the ileocecal valve gives exit to the gas contained in the large bowel whereas the tube in the proximal ileum drains the small bowel.

C G HERT

Stone H B : A Treatment for Pruritus Ani. *Bull Johns Hopkins Hosp* 1916 xxvii, 242

Stane gives a preliminary report on his use of alcohol injections in the treatment of this condition. The method was suggested to him by the value of the injections in facial and other forms of neuralgia.

The technique of injection is quite simple. The area in which the itching is complained of is carefully noted from the patient's description. Under general or local anæsthesia, the injection is then made so that this whole area is anæsthetized. In nearly all the cases reported by the author a local anæsthetic, usually novocaine 1 per cent or quinine and urea hydrochloride 1 per cent was employed. This form of anæsthesia proved to be quite satisfactory. The syringe is filled with alcohol 95 per cent and the usual fine hypodermic needle used for the injection. The needle is carried entirely through the skin vertically and then inclined sharply to the side so that it lies nearly parallel to the skin surface. When the needle is properly inserted in the subcutaneous fat, it can be moved fairly freely from side to side under the skin and can be felt moving with the finger placed over it. If this freedom of movement is lacking the needle is probably engaged in the corium, and if injections are thus made, sloughs may be expected to result. With the needle properly placed the whole area involved is injected, enough alcohol being used to underlay the area thoroughly. The injection may be carried up to the margin of the anus, but the author states that he has never injected the anal canal itself nor has he so far had

reason to believe that this would have improved the results. Of course before any injection is made the skin is cleaned up as for any other operative procedure.

This method accomplishes practically the same thing as the operative treatment for pruritus and is indicated in those cases of great intensity in which the usual measures fail. It has certain distinct advantages over the operative procedures. It is safer and there is no undermined skin with impaired circulation with a potential dead space under it in an area impossible to keep clean. It is quicker. It entails no dressings, stitches, or other post-operative annoyance to physician or patient and no hospital expense. It is quite as likely the author believes to be enduringly satisfactory and presents no greater possibilities of trouble.

GEORGE E. BEILLY

LIVER, PANCREAS, AND SPLEEN

Fowler R S : Echinococcus Cyst at the Left Lobe of the Liver Discharging into the Left Hepatic Duct. *Long Island M J* 1916 x, 317

Operation for echinococcus cyst involving the biliary passage is very rarely done, the rupture of such cysts into the passages is equally uncommon. Symptoms of such a condition are those of sudden blocking of the common duct accompanied by profound collapse i.e. severe pain in the epigastrium, chills, fever and jaundice. The diagnosis is only possible when cyst elements are recognized in the feces.

The case reported was that of a female, aged 31 who gave a history of recurrent epigastric pain, nausea, and jaundice for the past four months. Examination showed marked tenderness and rigidity over the right upper abdomen. Operation revealed intense inflammation of the gall bladder and ducts as well as local peritonitis. The gall bladder was filled with fine yellow sand the walls were thickened and inflamed. Drainage was instituted. Slight jaundice with slight epigastric pain persisted after operation and recovery was uneventful. Two weeks later the symptoms returned and a second operation was done. Many adhesions were found and the gall bladder was much distended. All the ducts were greatly enlarged the common duct to the size of the duodenum. The gall bladder and common duct were incised with escape of thin bile and bile-stained membranous detritus. The duct was then flushed with saline and numerous pieces of thick, green membrane were removed from this duct and the left hepatic duct.

Owing to collapse, the operation was speedily completed a fenestrated tube being placed in the left hepatic duct, one in the foramen of Winslow, one near the junction of the two ducts and one in the gall bladder.

Daily saline irrigations were accomplished through the tube in the duct, washing out various amounts of the detritus and the drainage tubes were gradu-

ally withdrawn. Good recovery resulted and three months later the patient remained well.

The pathological report showed echinococcus cyst wall but no daughter cysts. Repeated examinations of the stools failed to show any echinococcus elements. P. M. CHASE.

Rieques, I. R. An Unusual Complication of Hepatic Abscess (Una complicación poco frecuente del absceso hepático). *Gac. med. d. Caracas*. 9 6 vol.

The author reports a case in a man, 52 years old, of a purulent abscess of the liver emptying into the vena cava inferior. Liver abscess was diagnosed on the patient's arrival at the hospital. Hepatic puncture was done and about a liter of pus immediately withdrawn followed by injection of chlo hydrate of emetine. The patient however succumbed the following day and the condition was discovered at the autopsy.

The author refers to the great rarity of this termination of hepatic abscess. In Rendu's Encyclopedic Dictionary out of 563 collected cases of disrupted hepatic abscess only 3 are noted as discharging into the vena cava. In the author's case the communication with the vena cava was through the suprahepatic vein, one of the branches of which appeared destroyed in the neighborhood of the lesion. W. A. BARNES.

Liek, E.: Abdominal Gunshot Injuries. Especially Gunshot Injuries of the Liver (Über Bauchschüsse, insbesondere Leber Schüsse. Beitr. zur Chir. d. Leber). *Arch. f. Klin. Chir.* 9 6 500.

Liek says that the department of war surgery in which most had to be unlearned was the surgery of abdominal gunshot injuries. All surgeons went to the front with the conviction that abdominal wounds would not as a general rule be operated upon. The saying of Boerhaave fits the Boer War that all those shot through the abdomen, will live, if let alone, and will die if operated. had become common property.

Some reports published in the beginning of this war seem to confirm this conviction. Fifty and even seventy per cent of abdominal injuries were reported recovered under conservative treatment. However other opinions were soon expressed. Boehler observed 300 perforated abdominal wounds, which with the exception of 6 were all treated conservatively. 95 per cent died, the rest were in a hopeless condition.

Critical research therefore showed almost hopeless results from the conservative treatment and change of opinion was slowly but surely effected by the reports of successful results of operations for abdominal gunshot injuries. The great peculiarity among the abdominal wounded was the extraordinary change of the clinical aspect, the strong contrast between different patients. Some showed the hopeless picture of certain death, to which they succumbed within a day—others diagnosed as shot through the

stomach showing no evidence of serious injury were sitting about and eating heartily. This difference in the aspect and behavior of the abdominally injured is explained by the fact that one is lively and pulls through, not because his presumable stomach-shot has been treated conservatively but because his alimentary canal has not been injured. The other dies, because he has a perforated wound of the stomach or the intestine.

It is often asserted that gunshot wounds in the upper abdomen have a much better prognosis than those beneath the umbilicus. There is such a difference. The prognosis of abdominal gunshot injuries in the field hospital depends, in Liek's opinion upon whether or not the alimentary canal has been perforated. In other words, the threat of peritonitis dominates the situation. Shots in the upper abdomen however have more chance to avoid the intestinal anal than those in the lower abdomen. If only those shots which have injured the alimentary canal are considered true abdominal injuries, their prognosis with conservative treatment becomes bad.

Liek believes that the most important symptom of peritoneal irritation is the ether tension of the abdominal wall. This however is found in other conditions and in all doubtful cases one must incise, then the wound is examined. In Liek's field hospital service during the first fourteen months of the war 5 per cent of the wounded had abdominal gunshot injuries. Of these 53 per cent died others were transferred to base hospitals. About one-third of the non-operated cases eventually recovered.

Gunshot injuries of the liver give an apparently favorable prognosis similar to injuries of the upper abdomen when treated conservatively. Liek has observed 7 cases in which a spontaneous recovery of liver gunshot injury occurred. According to Liek experiences it appears certain that the modern small caliber bullets can pass through the liver from a much shorter distance than 100 cm. without effecting irreparable harm. The clinical aspect of liver gunshot injuries varies considerably. Smooth, completely penetrating shots end most favorably. Tangential shots are less favorable. They are similar to the tangential shots of the skull. Liek gives his observations of some cases in which clean liver shots complicated with injuries of the kidney etc. healed spontaneously. Altogether he saw only 27 liver injuries, these representing 23 per cent of those entering with the diagnosis of abdominal gunshot injury. However he thinks liver wounds are more frequent since in abdominal cases which came to autopsy showed liver injuries as well. Liver wounds are generally concomitant with other abdominal injuries and in Thole's statistics of 200 liver wounds 17 had concomitant injuries. In the 27 cases observed the diagnosis was made in 3 with certainty in 4 by operative findings in 2 by section, and in 7 by gall outflow. The outflow of gall in the wound was ob-

served in 37 per cent of the cases. Other observers such as Edler give a higher figure, 41.3 per cent.

Liek's mortality was less than that of other reporters. He lost 8 patients, 29.4 per cent. Korte's figure is 60.8 per cent. In Thole's statistics of liver gunshot wounds in civil practice the mortality in 200 collected cases was 49 per cent. From this low percentage, 29.4 per cent of deaths in Liek's field hospital the conclusion that liver injuries have a better prognosis than other abdominal injuries, would be false. As in other gunshots of the abdomen with intestinal injury peritonitis dominates the field so in liver injuries, hemorrhage is the danger. The majority of serious liver wounds succumb to hemorrhage on the battle field or in the field hospital.

While hemorrhage is the principal danger it is not the only one. Simultaneous injuries of adjoining organs—the right lung and the right kidney especially—may endanger life owing to necrosis, abscess of the liver, thrombosis of the large blood vessels, and secondary hemorrhages. These complications claim many victims.

The treatment of liver shots may be summarized as follows. Simple clear-through shots will recover with rest and morphine. Symptoms of heavy hemorrhage call for inspection of the wound and tamponade or suture of the liver as necessary. In tangential shots, especially those from artillery the irregularly torn sinus must be exposed, bone splinters of the ribs and all necrotic tissue removed and the wound loosely tamponed. Complications in the pleura are to be treated according to rule. The after complications, such as liver sequester and liver abscesses, must be treated according to general surgical principles. In the successful treatment of liver injuries as in other abdominal injuries everything depends upon early treatment. Liek cites several instances of the favorable results obtained from the immediate operative treatment of liver injuries.

W. A. BRENNAN

Erdmann J. F. and Heyd C. G. Relief of Chronic Obstructive Jaundice by Palliative Operation. *Am J M Sc.*, 1916 xlii 174.

The authors list the indications for operation in malignant obstruction to the biliary flow as follows: (1) Mistaken diagnosis—not infrequently operation for supposed malignancy reveals an inflammatory condition which subsides with recovery of the patient. It is only upon such premises that the occasional cures can be reasonably explained. Moynihan says: No one living is infallible in the differential diagnosis of obstructive jaundice. The diagnosis is always so difficult and the chance of a life saved is so important that however positive the evidence of malignancy may be I now advise operation in all cases. (2) The relief of distention pain—all cases do not suffer from pruritus or the mental states of cholemia but suffer a gradual increasing pain from distention of the biliary apparatus. (3) Intractable pruritus in many cases so severe

that the patients positively demand relief. (4) Social—to prolong life in comparative comfort to give the patient relief from his jaundice so that he may live with his family until such time as death takes place from metastasis or local extension of the growth. (5) Surgical euthanasia. The primary operative mortality in these conditions will be high but considering the absolutely hopeless outlook together with the urgent demand for relief one is warranted in selecting an operative procedure entailing a high rate of mortality.

A neoplasm at the ampulla of Vater either by its presence, by blocking of the duct or associated edema of the mucous membrane of the duodenum or common duct will bring about not only biliary obstruction but a variable degree of pancreatic obstruction. The degree of obstruction to pancreatic secretion will depend upon the individual anatomical topography of the ducts of the pancreas. In about 83 per cent the duct of Wirsung carries the entire pancreatic secretion in about 12 per cent, however the duct of Santorini is the main duct while in 54 per cent the duct of Santorini may act as a substitute for the duct of Wirsung. In certain cases the duct of Santorini might remain uninvolved for a considerable period of time and moreover, the duct of Santorini is not infrequently connected with the duct of Wirsung and thus it is possible for a drainage of the pancreatic secretion to take place into the duodenum even with almost complete biliary stasis in fact there may be complete biliary stasis with little or no pancreatic retention.

Any chronic obstructive condition of the duodenum below the ampulla of Vater will introduce in addition to the signs of biliary stasis those of pyloric stenosis, and in two of the cases presented herewith the clinical picture was that of chronic pyloric stenosis and chronic obstructive jaundice.

In obstructive conditions at the ampulla of Vater it is usual to find the gall bladder distended with bile (Courvoisier). This is not necessarily always the case, as a distinct hydrops and a well-dilated common duct filled with clear mucoid fluid has been observed and when this rather uncommon condition is seen it is associated with patulous cystic and hepatic ducts and mechanically represents a pressure atcholia. Kausch thinks that the hydrops in these cases is due to excessive secretion by the mucosa of the gall bladder and ducts whereby the duodenal opening being occluded the pressure in the biliary system being so raised that the bile secreted by the liver-cells is poured, not into the excretory ducts but back into the blood and lymph vessels of the liver. The most frequent obstructive condition is from carcinoma of the pancreas ampulla, or duodenum. Cancer of the duodenum represents about 0.4 per cent of all carcinomata, and at least 70 per cent of this number are carcinoma of the ampulla of Vater (Geiser). Pancreatic cancer is the most rapidly fatal of any form of carcinoma.

death ensues within seven or eight months from the time of onset of noticeable symptoms, and occurs usually before the growth metastasizes or obtains any great local extension. There is probably no position within the body outside the central nervous system where a growth, while yet so small is heralded by more wide-spread symptoms than at the lower end of the common bile duct.

An anastomosis can be made between the gall bladder or the hepatic duct or the common duct and any contiguous bowel surface as (1) an anastomosis of the gall-bladder and varying portions of the gastro-intestinal tract — cholecystogastrostomy, cholecystoduodenostomy, cholecystenterostomy, cholecystocolostomy (2) anastomosis between the hepatic duct and certain portions of the viscera, preferably the stomach or duodenum or a portion of the small intestine or anastomosis between the common duct and the stomach, duodenum or small intestine. The choice of a particular operation will depend upon a number of factors such as (1) the physiological efficiency of the procedure (2) the ease of technical accomplishment (3) the relative immunity from ascending infection and (4) the immediate and remote effect upon the patient's metabolism.

A consideration of the merits of cholecystogastrostomy, cholecystenterostomy and cholecystocolostomy seems to prove that the best results are obtained with the first procedure. Physiologically considered there is no objection to the presence of bile in the stomach, as has been demonstrated so often clinically and proved by Strendel in his experiments on animals. Technically the union of the gall bladder and the stomach is probably more easily performed than any other form of anastomosis, as the parts are naturally in close and intimate relationship, and little if any mobilization is necessary to bring the viscera in apposition. Cholecystenterostomy carries with it the possibilities of angulation and the necessity for a secondary entero-enterostomy to prevent kinking, and of course increased risk. On theoretical grounds the union between the colon and gall bladder is to be deprecated and physiologically it is defective, as it empties the biliary secretion into a portion of the gut tube not given to digestive processes and upon other grounds it is also objectionable (1) on account of the reflux of the highly charged bacterial content of the colon and (2) the possibility of reversed mucous currents as described by Bond (3) the loss of the digestive functions of the bile, especially in the saponification of fats, (4) the fact that the bile is so soon evacuated with the stool means a rapid loss of the acid salts of the bile which would normally be reabsorbed in the intestine.

The authors conclude as follows:

1. All cases of obstructive jaundice are entitled to operative consideration. There is a certain definite percentage of cases that are cured because there has been a mistake in the diagnosis.

2. Any of the above operations are not prohibitive

considering the severity of the disease and its hopeless outlook.

3. The immediate relief from itching, in addition to the prolongation of life is an exceptionally strong argument for operation.

4. Operation obviates the development of pressure pain from increasing distention of the biliary apparatus.

5. These operations are advised solely as palliative procedures and as such their purpose must be clearly understood. C. G. HERN.

Fellé: Rupture of the Liver (Rupture du foie)
P. 11 m. 6 p. 350

The case reported occurred in a woman who was killed by an explosion caused by a bomb from an aeroplane. After a few minutes she showed all the signs of a hemothorax but there was no sign of a wound on the thorax or abdomen save a very slight redness of the lower left thorax. Palpation showed a rib fracture. The abdomen was perfectly supple and not painful, and the urine was clear. The woman died in coma three-quarters of an hour later without operation.

Necropsy showed a fracture of the sixth left rib. The left lobe of the liver had a tear about a finger breadth in width which involved all the parenchyma. Hemorrhage had been free into the costic region and the posterior part of the abdomen. The liver rupture may have been due directly to the fractured rib although the pericardium and the diaphragm were intact or it may have been due to a thoracic contusion from a stone or lump of soil hurled by the explosion and which had left no mark on the integument. Nevertheless, this liver rupture was not manifested physically by any symptom which could have suggested its presence. W. A. BERNHARD.

Guthrie, D.: Indications for Cholecystectomy. J. Am. M. Ass. 9 p. 1674, 653

The author submitted a questionnaire to 45 experienced abdominal surgeons. The questions submitted were as follows:

Question: What percentage of cases of cholecystostomy have had a recurrence of trouble following operation? The numerical percentages given by 39 men varied from 10 to 33 1/2 per cent of failures the average being 9.5 per cent. Coffey reports infrequent recurrences. LaPlace gives 33 1/2 per cent. Judd writes, impossible to state, but we have had a large number of recurrences. Stanton, who has carefully investigated Ochsner's cases and his own, reports recurrences of trouble in 14.5 per cent of cases. Kehr estimates there has been 15 per cent of failures in his work.

Question: Are you performing the operation of cholecystectomy more frequently than in the past? To this there were 45 answers: 36 answered in the affirmative, 9 in the negative. Bevan and Frazier perform cholecystectomy in from 80 to 90 per cent of their cases. Elding in 60 per cent. Gibbon in 50 per cent and Clark in 33 1/2 per cent. Martin

employs cholecystectomy more frequently but considers it a more dangerous operation. Deaver more frequently than formerly but not so often as many surgeons. Crile not much more often. In 1907 the Mayo's performed 100 cholecystectomies and 261 cholecystostomies in 1915 915 cholecystectomies, and but 60 cholecystostomies. There were 9 negative replies to the question Bloodgood Kelly Cullen, and Grant are not performing the operation so frequently as formerly.

Question 3. Have the results been better than when simple drainage was used? To this 36 answered yes 7 answered no 2 failed to answer.

Question 4. In what cases do you consider cholecystectomy the operation of choice? The chief indications for removal of the gall bladder recommended by the majority or any disease of the gall bladder wall itself and damage to the cystic duct. Eighty per cent advised removal when any disease of the gall bladder wall with or without stone is found. Several called attention to the possibility of systemic joint infection secondary to disease in the wall of the gall-bladder as pointed out by Rose now and advised cholecystectomy as a prevention.

Question 5. What are the contra indications for cholecystectomy? The chief replies were inexperience of the operator and inexperience of the anesthetist. In addition to these many specific contra indications were urged, most noteworthy being chronic pancreatitis with gastric symptoms which cannot be cured by cholecystectomy but requires prolonged drainage.

Question 6. As a rule do you treat acute empyema of the gall bladder with cholecystectomy or drainage? To this 44 men replied 33 favored cholecystectomy.

Question 7. How does the mortality of cholecystectomy compare with cholecystostomy in your work? Among the 44 answers to this question two stated the difference in mortality was not known 4 men's work showed a lower mortality for cholecystectomy than for cholecystostomy 18 reported the mortality the same for each operation and 21 had a higher mortality for cholecystectomy than for cholecystostomy ranging from 0.5 to 3 per cent. The mortality for either operation was estimated by many men to be below 2 per cent.

The author's conclusions are as follows:

1. Reports show that recurrences happen in 9.5 per cent of cases that have had cholecystostomies performed. The recurrence of trouble following cholecystectomy is certainly small the exact percentage is not known.

2. Cholecystectomy is employed much more frequently than in the past and is a better operation, but it is attended with many more operative difficulties and dangers than simple drainage. The gall bladder should be removed when its wall is diseased or the patency of the cystic duct is in question provided the patient's condition will permit it.

The contra indications for the operation are criti-

cal states of the patient acute empyema, infection of the ducts and pancreatitis where drainage is desired. It is safer to treat acute empyema of the gall-bladder with simple drainage, and it is only fair to explain to the patient that a second operation may be necessary.

C. G. HAYD

Balfour D. C. The Spleen in Its Relationship to Pernicious Anæmia Splenic Anæmia and Hemolytic Jaundice *Canad J M & S* 1916 xl 47

The author makes a series of observations based on the study of splenectomies performed in the Mayo clinic for various diseases.

The splenic function is not fully known although there is ample evidence to show that in infancy it is part of the blood forming mechanism of the body. Removal of the spleen is not followed by metabolic disturbances thus differing from other ductless glands. Its function in adult life is probably that of a scavenger of waste matter and is no doubt supplementary to some other organ.

The spleen is first evident in the fetus about the fifth week and arises from the mesogastrium. At six months the triangular shape, capsule, and malpighian vessels can be easily differentiated the latter being formed by a collection of lymphocytes in the adventitia of the arteries.

Splenic anemia or Banti's disease is characterized by splenomegaly and a definite blood change. Whether the splenomegaly is the cause of the blood change or vice versa is unsettled although the improvement following splenectomy would point to the former.

In early typical cases the diagnosis is simple. The low color-index, absence of nucleated red cells and enlarged spleen are pathognomonic and exclude anemia of the pernicious type. In the latter stages characterized by cirrhotic liver, ascites jaundice, and repeated hemorrhages differentiation is difficult. It is likewise most difficult in children to distinguish between von Jaksch's disease (splenic anemia of infancy) and the more adult type the blood-picture of the former showing a leucocytosis a variable number of marrow-cells but a relatively high color index.

Although splenectomy is the operation of choice, the presence of continuous high fever is considered a bad prognosis. The mortality of the operation depends on the stage of the disease. In the Mayo clinic in 31 cases it has been 9.6 per cent. In a case occurring in a child of two and one-half years splenectomy was followed by complete recovery.

Hemolytic jaundice is characterized by chronic jaundice, the result of hemolysis and splenomegaly. Etiologically the splenic factor is strongly suspected as marked improvement follows splenectomy the rôle of the spleen probably being similar to that of the thyroid in exophthalmic goiter.

The congenital form of this disease is most common and is usually familial. It is characterized by jaundice and splenomegaly from birth. The ac-

quired form is most common in the third decade and is much more severe. In both, exacerbations of the jaundice, malaise, headache, and hemorrhages are found. The jaundice does not cause itching; there are no clay stools or petechiae and no increase in the pulse-rate as in common duct obstructions. Anemia is not always present in early cases but becomes pronounced in the later stages. Urobilin is usually found.

Splenectomy is the operation of choice and is not only curative but has a mortality less than 5 per cent. A case occurring in a boy aged 11 is cited.

Although splenectomy in pernicious anemia has been tried by a number of surgeons its value remains undecided. However it is worthy of consideration in such a uniformly fatal disease and must be done entirely on a speculative basis. The operation should never be an emergency one nor one of last resort and should always be preceded by transfusions of blood. The general response of the patient to this procedure is usually indicative of the results to be obtained by splenectomy.

Regarding results Balfour states: Our experience has been such as to lead us to believe that with further knowledge as to the proper selection of cases splenectomy promises more certainty as to primary results, and probably late results, than any form of treatment. P. M. CHAS.

Bagge, J. A Complication Arising in the Treatment of a Splenic Enlargement with Thorium X. (Eine Komplikation bei der Thorium X Behandlung des Miliumors). *T. M. Verh. S. 18* Cong. Goeteborg 9 6 July.

A case of Banti's disease was treated with injections of thorium-X. Although smaller doses than usual were employed marked skin changes developed, and the Banti symptoms disappeared.

L. A. JENSEN

MISCELLANEOUS

Barnaby. Mobile Bullets in the Abdominal Cavity (Rapport sur balles mobiles dans la vité abdominale). *P. ess. med.* 9 6 P. 333.

Barnaby reports four cases: two bullets embedded in the epiploon, one in the sigmoidal loop and one in the transverse mesocolon. The latter is of especial interest as it was a penetrating thoraco-abdominal wound. The orifice of entry was on the axillary line at the level of the seventh rib the bullet remaining free in the upper part of the abdominal cavity about a fingerbreadth above the xiphoid appendix. A median subumbilical laparotomy was made and the bullet was found located in the base of the transverse mesocolon to the right of the vertebral column and bathed in a small abscess. The author calls particular attention to the following points:

1. The total absence of any functional symptoms, either pleuropulmonary or abdominal, from the time of the occurrence of the injury up to the

twenty-third day. Gastro-intestinal disturbance, pain in the xiphoid appendical region, and an elevation of temperature which called for surgical operation were also noted.

2. The trajectory of this projectile was quite extraordinary. It traversed the pleura, lung, diaphragm, passed in front of the body of the pancreas, behind the stomach and passing the head of the pancreas buried itself in the transverse mesocolon without injuring any of these organs.

W. A. BRENNAN.

Sliver, D. The Role of Visceroprotozoa in the Etiology of Arthritis Deformans. *Am. J. Orth. Surg.* 9 6 415 3 3.

Arthritis deformans (rheumatoid arthritis, chronic polyarthritis) is a disease of complex etiology many causes being active in its inception, and similarly after it has once begun, many causes playing a part in perpetuating it. That certain individuals possess a lessened joint resistance, either hereditary or acquired, seems a necessary assumption. It is also evident that anything which lowers nerve-tone or affects the quality or quantity of the blood supply to the joints acts still further to impair joint vitality and so predisposes to the development of joint disease. The accumulating evidence points to some local infection especially of a mucous membrane.

He concludes as follows: It seems to have been demonstrated that the active agent in arthritis deformans may enter through the intestinal tract. This active agent is undoubtedly bacterial, probably most commonly streptococcus, and the intestinal mucosa is thus to be regarded as one of a number of mucous surfaces through which infection may enter the system. Through the production of stasis and probably also through its influence on glandular secretions, visceroprotozoa act to cause increased intestinal infection, and so favor systemic invasion thus in an individual with lessened joint resistance, it may be the deciding factor in the development of arthritis. How frequently arthritis develops in visceroprotozoa bleitis and what the proportion is between the number of cases of arthritis due to this cause and those arising from other intestinal infections cannot now be stated. PHILIP LEWIN.

Vitrac, J. Strangulated Diaphragmatic Hernia (Hernie diaphragmatique étranglée). *J. de med. de Bord.* 9 6 1 27111, 89.

The author reports a case coming to the hospital with unquestionable symptoms of intestinal obstruction. Examination disclosed epigastric pain both spontaneous and on regional pressure. There was moderate distention of the abdomen. The thorax gave some unilateral symptoms, abolition of vesicular murmurs, but neither vaulting nor excessive sonority. These were ascribed to pulmonary congestion.

Laparotomy did not succeed in disclosing the true conditions and the patient died the day following. Autopsy showed a large hernial opening in the

left part of the diaphragm behind the pericardium and midway between the aortic and oesophageal openings. The hernial ring measured 5 cm. A large part of the large and small intestines and almost all the great epiploon had herniated into the thoracic cavity. The condition was apparently of long standing, the strangulation being due to a second loop of small intestine becoming herniated.

The author believes that in a laparotomy for a case of intestinal obstruction where the origin is doubtful if it is seen that the obstacle is highly situated the possibility of a diaphragmatic hernia must never be overlooked. In order to discover this if existing the hand must be introduced under the concavity of the diaphragm after having traversed the greater curvature of the stomach. If such an exploration causes any doubt the operation must be interrupted momentarily until a careful re-examination of the thorax is made and an exploratory puncture if needed. If the diagnosis

then becomes evident or if thus made in the course of the laparotomy thoracotomy should be done, the herniated viscera freed and the hernial orifice closed.

W. A. BRENNAN

Stroem S: Eventration and Hernia Diaphragmatica from a Roentgenological Viewpoint. Obtained from Several Cases Diagnosed with the X Ray (Ueber Eventratio und Hernia diaphragmatica vom roentgenologischen Gesichtspunkte aus anlässlich einiger roentgendagnostizierter Fälle). *Tr XI Verh Surg Cong Goeteborg* 1916 July.

In the literature there are over 500 cases of hernia diaphragmatica reported but only a few were diagnosed and operated upon, and these operations were for incarceration. The X ray permits a much more certain diagnosis and result. The author by means of X ray pictures demonstrated a series of such cases diagnosed in this manner.

L. A. JUENKE

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Berry J M: Observations on the Presence of Roentgenological Shadows Associated with Subdeltoid Bursitis; Also on the Presence of Similar Shadows in Other Parts of the Body. *Am J Orth Surg* 1916 xiv 481.

The author believes that it is evident that in certain cases of clinically diagnosed, subdeltoid bursitis, the roentgen ray has shown shadows in the region of the subdeltoid bursa, which have been proved by operation to be due to a calcareous deposit but it is in dispute as to just where the deposit occurs i.e., in the bursa the walls of the bursa, or in the tendons and bodies of the spinati muscles. In certain other cases where the roentgenogram has shown shadows similar to the above they have been observed to disappear under simple treatment, to exist without causing serious inconvenience, and to be present in at least two regions other than the subdeltoid viz over the great trochanter of the femur and at the knee joint.

The shadows may appear very shortly after an injury and have been observed to disappear almost as quickly. They may be single or multiple, resembling the shadows of calculi but are sometimes so extensive as to suggest the extravasation of an opaque fluid in the tissues. The operative findings would tend to show that the shadows are due to a calcareous deposit but it is difficult to believe that a calcareous deposit could be laid down so rapidly and at times reabsorbed so quickly.

Berry states that the whole subject is at present

very confused, and that all cases should be carefully studied and checked up by roentgenograms operation when indicated, combined with careful anatomical study and chemical examination.

PHILIP LEWIN

Campbell W C: Localized Osteospondylitis. *J Am M Ass* 1916 lxvii, 575.

Osteospondylitis is a new term applied by Campbell to a local process affecting a single intervertebral disk. The condition is analogous to monarticular osteo-arthritis or to limited spondylitis deformans of the hypertrophic type. The X ray shows crescent shaped lamellae of bone thrown out from the body of one vertebra to its adjacent fellow sometimes completely encapsulating the disk. These bony lamellae may connect the bodies at their margins or may extend from the center of the exterior surface.

Of the four cases cited by Campbell one man had been operated upon for appendicitis and later for adhesions, before the true etiology had been discovered.

In the discussion of the paper it was brought out that the condition is not to be construed as any thing but a more or less local manifestation of a generalized process, and that the term infectious arthritis of the spine should be used instead of any new term.

ROBERT G. PACKARD

Friesberg A. H: The Evolution of Osteochondritis Deformans Coxae Juvenilis. *J Am M Ass* 1916 lxvii, 658.

The author reports two cases of Perthes disease and suggests that the disease is of secondary infec-

tious origin. Although the deformity in the hip resembles that of the adult degenerative arthritis it differs from it in that there is no new bone formation. Cases observed before the advent of Pott's description in 1900 were most likely called mild tuberculosis and reports of recovery with full motion of a tubercular hip probably were based on an erroneous diagnosis.

The author disagrees with Legg, who has suggested a traumatic etiology and claims that a careful search of the history will reveal in most cases an early inflammatory condition with slight fever and local tenderness and spasm. For treatment he recommends continued fixation and regards as fallacious the idea that because symptoms are mild and return of function practically assured, mechanical protection is unnecessary. He suggests that weight-bearing is influential in the production of the deformity as seen in the terminal stages.

W. A. C. VIK.

Costa, T. Contribution to the Pathogenesis of Osgood-Schlatter Disease (Contributo alla patogenesi della malattia di Schlatter-Osgood) *Ped. di Roma*, 1936, 11, 4, 418-421.

The author refers to the great discrepancies among the various authors who have written on the pathogenesis of the so-called Osgood-Schlatter disease. He refers succinctly to the various theories advanced, not only by Osgood and Schlatter but also by Alsborg, Bergmann, Thompson, Kirchner, Winslow, Schultz, and others.

A case is described by the author in which a boy while in the act of throwing a stone fell to the ground experiencing a severe pain in the right knee. He was, however, able to walk home and was treated for knee contusion. The pain and functional disability continued and about a month later the boy came under the author's care. Examination showed a tumefaction clearly circumscribed to the anterior tuberosity of the tibia, painful on pressure, without erythema and without the least trace of osseous crepitation. On the basis of this semiologic examination and the further findings obtained from a radiologic investigation the author concluded that it was a case of Osgood-Schlatter disease.

Examination of the radiographs in this case showed at the level of the anterior tibial tuberosity a small fragment partially detached from the underlying osseous mass; the fragment nevertheless evidently was still in continuity by its superior pole with the tibial body. The contour of this fragment was irregular and it appeared to be in process of absorption.

The author, subordinating the interpretation of the radiograph to the etiologic data, thinks that the boy in the throwing of this stone must have lacerated the rotulotibial tendon at the point in which it is inserted in the tibia and especially the underlying periosteum with tearing of the osseous lamellae which constitute the anterior portion of the tuberosity. The point of tendinous insertion

thus diminished its resistance caused a partial functional incapacity.

Reviewing the various pathogenetic theories the author selects that of Schultz, which is based on the principle that following a brusque contraction of the femoral quadriceps, some tearing of the perosteum is produced where the tendon of this muscle is inserted in the bone. To these periosteal lacerations, which according to Schultz result from a general weakness of the whole organism, there is an alteration in the compactness of the underlying bone which favors either total or partial displacement of the apophysis following a movement of the limb in extension on the thigh.

The author thinks that the study of his case shows the truth of Schultz' theory.

1. In the sharp contractions of the quadriceps tendon.

By the periosteal lacerations especially at the tibial insertion with some injury of the bony lamellae.

3. By the incipient rarefaction of the osseous tissues following nutritive deficiency.

4. From the general debility of the subject.

He is of the opinion, therefore that Schultz' conceptions best accord with the radiographic and semiologic findings and that unless demonstrated to the contrary the Osgood-Schlatter disease must be placed in the group of traumatic lesions, to trauma being added general debility in the patient.

W. A. BREDENAK.

Prat. Wounds of the Large Articulations Particularly of the Knee and Hip (*Plaies des grandes articulations en particulier genou et hanche*) *Bull. Intern. Soc. de Ch. de P.* 1936, 21, 777.

Prat believes that when an articulation injury shows evident infection it is necessary to operate and to do so widely. He insists on the insidious nature of certain arthritis, particularly those which result from the propagation of a fissure proceeding from a periparticular fracture; there is at first no pain, merely a progressive increase in pulse and temperature.

If the infection is slight Prat drains the articulation at the lowest point after arthrotomy and ether lavage. If the infection is more serious and a return of movement cannot be hoped for he makes an extremely large arthrotomy with which he often combines a synovectomy; the synovial appearing to him one of the principal elements for the persistence of the suppuration.

If arthrotomy with or without synovectomy is insufficient and there is much bone debris to be cleared, a resection is called for. In all cases of articular lesions Prat immobilizes the joint in one of his special apparatuses. In 6 cases of knee joint injuries where operation was carried out 18 to 24 hours after occurrence was recovered with movement and 1 with ankylosis. In 7 hip cases recovery has been obtained twice by simple plaster immobilization with continuous extension and in 1 case by

curettage of the head of the femur In the 4 other cases, resection gave 3 recoveries and 1 death

W. A. BRENNAN

Chaput Periarticular Abscess Complicating Suppurative Arthritis of the Knee (*Sur les abcès périarticulaires compliquant les arthrites suppurées du genou*) *Bull et mém Soc de chir de Par* 1916 xlii, 1783

Chaput thinks that diagnosis of periarticular abscess is generally very difficult and very often it is not recognized up to the time when the abscess is on the point of opening in the skin and then it is generally too late and incision will not cure the patient.

He thinks it is possible to make the diagnosis much earlier by taking the following signs into consideration

1 A considerable edema of the limb and of the foot is always to be suspected when it occurs in the course of a knee arthritis and very frequently it indicates a posterior periarticular abscess of the limb

2 When pressure on the thigh or on the calf of the leg provokes an abundant issue of pus through the articulation incisions usually there is an abscess some distance away

3 Every knee arthritis well drained which is accompanied by an abundant flow of pus or by persistent fever is in general complicated by a distant abscess.

In treatment of such abscesses success will be obtained only by early action and even prevention should be attempted by free drainage and complete removal of bony fragments

W. A. BRENNAN

MacDonald W. M.: Contractures of the Hand After Wounds of the Upper Limb *Brit. M J* 1916 li, 209.

This paper is principally a neurological survey of the various contractures of the hand as the result of war injuries. Some of the peculiarities of these contractures are (1) They rarely occur in civilians in officers, and rarely in non-commissioned officers. (2) They develop after slight and rarely after severe wounds. (3) The thumb is rarely affected. (4) They occur more commonly in men who come from certain districts and they are especially prone to occur in certain hospitals where the atmosphere is suited to the culture of functional troubles yet they can not be classed as purely hysterical and do not often yield to psychotherapy

ROBERT B. COTFIELD

FRACTURES AND DISLOCATIONS

Le Breton, P.: Fracture of the Odontoid Process of the Axis *Am. J. Orth. Surg.* 1916 ix, 549.

The case reported is worthy of note because of the character of the injury the absence of paralytic symptoms the voluntary reduction by the patient of his own subluxation, and the gradual recovery

The patient a male 22 years of age, was driving a wagon while sitting on the end of a barrel. The barrel gave way precipitating him forward. The horses, startled ran to one side into a pole, and one horse, backing suddenly sat with his haunches on the right side of the neck and head of the patient. Examination revealed wry neck without spasticity of the muscles. The patient was in constant pain. There was no voluntary motion of the head the cervical spine showed a crescentic curve to the left. A bony projection to the left of the median line one and one-quarter inches below the occiput, was evidently the spinous process of the axis, displaced. This point was tender to pressure. Above this was a depression and below down to the sixth cervical was another depression. The finger in the pharynx discovered no special irregularity. Roentgenograms through the mouth showed a distinct fracture at the base of the odontoid process. A lateral view showed that the atlas was tipped forward making the anterior line of the vertebral bodies irregular. An anteroposterior view of the neck showed a bend at the junction of the third and fourth cervical suggesting a subluxation at that point. Head traction was of no benefit. The advice of consultants was that it was too dangerous to attempt reduction under anesthesia. One week after admission to the hospital, the patient placed his right hand at the back of his neck and his left on top of his head and wrenched his head straight with considerable force. He felt something give and at once the steady pain ceased and he found he could move his head much more freely.

The next morning he was sitting up in bed smiling. A plaster collar was applied and he left the hospital. Six months later he was doing very well.

PHILIP LEWIS

Ladd, W. E.: Fractures of the Lower End of the Humerus. *Boston M & S J* 1916 clxxv 220

Ladd reports the end results of forty five cases of fracture of the lower end of the humerus in which the records were complete and the skiagrams satisfactory.

These fractures occurred with much greater frequency in the young than in adults. The cases were grouped into fractures of the internal condyle fractures of the external condyle, and supracondylar fractures.

The best results were secured in the fractures of the internal condyle. Fractures of the external condyle required operation for replacement of the fragment more often than any other group. The position of acute flexion is most applicable for all fractures of the lower end of the humerus. Early passive motion and massage are not conducive to the best results. Fracture of the lower end of the humerus treated properly should result in a perfect arm in nine cases out of ten and a useful arm in practically every case. ROBERT B. COTFIELD

Rivett, L. C.: A Simple Method of Putting Up Fractures in the Region of the Elbow Joint in the Fully Flexed Position. *Brit M J* 9 6 11, 56.

Instead of strapping and bandaging the whole limb and chest in fractures of the elbow Rivett introduces a simple method of corrective fixation in extreme flexion. He takes two strips of adhesive plaster 12 x 5 inches. The first strip maintains the forearm in full flexion, by encircling the arm just below the axilla, and the forearm just above the wrist thus not interfering with the circulation. The second strip is applied to the back of the fore arm and hand, then placed over the same shoulder and fixed to the back. RO CAT C PACKARD

Cotton F J. The Treatment of Hip Fractures. *Brit M J* 9 6 11, 438.

Cotton calls attention to the wretched results in hip fractures, 50 per cent (partial or total) permanent cripples resulting from the present methods of treatment.

There are two classes (1) the trochanteric which unite easily with much callus, and in which position concerns us mostly (2) subcapital where position and bony union, the latter often failing because of synovial fluid, are the problems. In the first class any method obtaining sufficient abduction suffices. The subcapital if impacted and kept so, unite slowly. If loosened non-union and crippling result.

For 6 years Cotton has secured impaction in about 30 cases by the method of hammer impactions after correction and plaster spica.

II W MEYEROW.

Moore G A. The Flexed Spica and Wheel Chair in the Treatment of Fractures of the Neck of the Femur. *Brit M J* 9 6 11, 443.

The author reports seventeen cases of fracture of the hip treated by means of plaster of Paris spica in flexion and abduction thus permitting old patients in whom danger of hypostatic pneumonia, decubitus, etc. are to be feared an opportunity to be up and about in wheel chairs throughout the period of disability. II W MEYEROW.

Childs, S. B. A Plea for Conservatism in the Treatment of Closed Fractures from a Roentgenological Standpoint. *Am J Roentgenol* 19 6 11, 390.

Based upon a roentgenological experience with over 7,000 cases of fracture, the author offers the following conclusions:

1. Perfect apposition or alignment is not necessary to obtain a good anatomical or functional result, or both.

2. Where some anterior posterior, or lateral displacement exists, not to exceed one-half the diameter of the shaft of a weight-bearing long bone a good functional result can be expected but a longer time for union must be anticipated.

3. In Pott's and Colles' fractures, a proper align-

ment of the axis of the shaft of the tibia to the astragalus, and the axis of the shaft of the radius to the space between the second and third metacarpals although the ends of the fragments of the fracture are not in close apposition will probably give good anatomical and functional results.

4. In cases where doubt exists as to the probability of obtaining a good functional result, the patient should be told of the condition and allowed to choose between the two methods of procedure.

5. Patients should be informed of the possibility of non union resulting from constitutional conditions or other unknown causes, although the ends of the fracture are in good apposition.

6. Probably less than ten per cent of closed fractures require an open operation for proper fixation of the fragments.

7. Ununited fractures after six to eight weeks, in which deficit in callus formation is apparent, should be treated constitutionally if indications therefore exist and the patient should be encouraged to put some weight upon the limb before operation is advised. ROBERT B. COVINO.

Lathrop, W. The Sliding Graft and the Kangaroo Suture in Fresh Fractures; Albee Technique. *Am J Surg* Phila 9 6 11, 68.

The author reports a series of 43 cases of fractures of the femur, tibia and fibula, radius and ulna and patella. He operated on 41 of these cases using the Albee kangaroo suture or the sliding graft and reports very favorable results in all cases. He gives a few of the cases in detail and shows radiograms of a number of cases before and after operation. He calls attention to the tendency of the autogenous graft to live and grow in the presence of pus.

The author's procedure in all fresh fractures is to take an X-ray on admission, etherize the patient, reduce the fracture, immobilize and then take several plates to see that the position is good. If, after five to ten days, the limb appears to be in good position as shown by measurement and examination it is not interfered with so far as operation is concerned. If however there is deformity or overriding he does not delay but cuts down and uses either the kangaroo suture or sliding graft, and puts the limb up in plaster. He recommends plaster of Paris as the best means of immobilization.

In summing up he says, that from his experience in several hundred cases during the past four years, and having used wires, plates, nails, and later the Albee methods that the latter affords by far the best result. JAMES O. WALLACE.

SURGERY OF THE BONES, JOINTS, ETC.

Taylor R. T.: Shortening Long Legs and Lengthening Short Legs. *Am J Orth Surg* 9 6 11, 594.

To shorten a leg Taylor recommends the following: An incision 15 to 20 cm. long over the external surface of the middle third of the femur. Free in

ciskoo of the iliotibial fascia is made lengthwise and by transverse section of it the fibers of the vastus externus are freely exposed which by blunt dissection and retractors can be separated down to the bone which is readily freed by muscular attachment. A special grooved director shaped like a sickle with the groove on the concavity to carry a Gigli saw is passed under and around the bone and the desired length of bone removed. An intra-medullary bone-peg is inserted and bone pegs through and through are used as dowels after the bone ends have been mortised with the upper fragment posterior. The dowels are made from a tibial graft.

To lengthen a femur is a more difficult procedure. It should be a two-stage operation. At first the adductors iliotibial band and hamstrings are divided and the dowels are made from the tibial crest and kept in sterile salt solution on ice. At the second sitting the technique described above is employed. Then with the circular electric saw a linear incision is made on the long axis of the bone on the outer side of the desired length, i.e. at least 2 cm. longer than it is desired to lengthen the limb. With a thin rounded or guarded end hand saw a half section is made on the anterior aspect of the bone down to the upper end of the longitudinal incision. Similarly a half section is made on the posterior aspect of the bone up to the longitudinal incision at the lower end. Next a nickel-plated spatula is passed around the bone on the inner side to protect the vessels, while a small electric drill cuts the cortex at intervals through on the inner side of the bone by passing it from the outside longitudinal incision through the medullary cavity to the cortex behind. With a series of these holes it is then easy with a small thin osteotome to cause separation of the two halves of the mortise. Prior to the operation traction apparatus is applied below the knee and is used until the desired lengthening has been obtained when dowels are inserted in drill holes to hold the fragments in apposition. A long spica cast is then applied. **PHILIP LEWIS**

Collie J. Immobility After Joint Injury. *Lancet* Lond. 1916 cxi 228

Fixation for long periods of time after fractures or dislocations is almost sure to result in adhesions forming in and about the immobilized joints. This should be prevented by early passive movements. Adhesions sometimes take place in as short a time as three weeks. They may bind together the articular surfaces and the folds of synovial membrane in the joint, or they may be entirely outside the joint. The tendons may become adherent to their sheaths as a result of tenosynovitis. Attempts to break down the adhesions under nitrous oxide anesthesia to the out-patient department of a hospital is entirely wrong. The anesthesia is not sufficient to completely relax the muscles about the joint and the patient does not return on the succeeding days for massage and passive movements which are so

necessary. The limb should never be bandaged or splinted after breaking up the adhesions. The muscles should be given light work at first in order to coax them as it were gradually increasing the weight or the work as they become stronger.

ROBERT B. COFIELD

Horsley J. S. Operative Treatment for Threatened Gangrene of the Foot. *J. Am. M. Ass.* 1916 lxxv 493

The causes of gangrene are discussed, namely arteriosclerosis, intermittent claudication, Raynaud's disease, obliterating endarteritis. In the author's opinion in the reversal of the circulation by lateral anastomosis of the femoral artery and vein the blood never reaches the foot. The valves in the femoral vein cause an obstruction and the collateral circulation takes up the decrease. In reported cases where the procedure has shown some improvement the result was due to increase in the arterial blood in the foot. Ligation of the femoral vein produces the same condition. Two cases are reported. It is doubtful if the results vindicate the operation.

CURTIS LEE HALL

Borchgrevink C. Wire Extension (Drahtextension). *Tr. VI. Verh. Sg. C. Sg. Copenh.* 1916 July

In cases of fracture of the lower extremity the author recommends the application of extension by means of an aluminum bronze wire brought directly through the calcaneus. The method is also applicable to the elbow.

BORTELUS acknowledged the correct principle of the Steinmann extension method which is applied directly to the bone but instead of the wire he applies claw-like spring hooks to the bone to avoid the canal formed by driving a nail through the bone.

L. A. JUENKE

Blanchard W. Osteotomy and Osteoclasis. *J. Am. M. Ass.* 1916 lxxv 504.

Several cases of severe rachitic deformities are reported which were corrected by the use of the Grattan osteoclast which the author claims gives better results than osteotomy in children under twelve.

By means of the osteoclast osteoclasis or bone stretching without breaking can be obtained which has decided advantages.

The arguments advanced against osteotomy are mostly theoretical. No union can be guarded against by avoiding operating in the subacute stage of rachitis, and avoiding epiphyseal trauma. For low anterior bent tibia osteotomy is preferable. The MacEwen osteotomy is advised in children over twelve or in adults.

CURTIS LEE HALL

Ryerson L. W. Fat Embolism in Bone Surgery; Incidence and Prevention. *J. Am. M. Ass.* 1916 lxxv 637

The incubation period in fat embolism is from twenty-four to thirty-six hours after traumatism.

whether surgical or accidental. In severe crushing injuries this period may be reduced to three hours. Difficulty of respiration, characterized as air hunger, occurs when the fat enters the lung from the right heart. The temperature in this variety is not greatly elevated but the pulse and respiration are rapid. When the fat passes from the lung to the left heart and into the general circulation it interferes with the cerebral circulation causing nausea and vomiting, somnolence or a comatose condition may ensue. The temperature in this type may rise as high as 100 or 107 F. Fat appears in the urine and sometimes in the sputum. Petechiae in the skin may appear.

Prophylaxis is the only satisfactory measure in treating this condition. The employment of the tourniquet for one half hour after a severe crushing injury or during an operation is of great value. Another precaution is to avoid the transportation of patients with such injuries. R. A. ST. B. C. FIELD.

Nové-Josserand, G. Reconstitution of Two-thirds of the Humerus by Simple Periosteal Regeneration (Reconstitution des deux tiers de l'humerus par simple régénération périostéale). *Lyon med.* 9 6 crv 337.

Nové-Josserand cites this case to show what preservation of the periosteum can do in war wounds. A soldier received a gunshot wound in the upper part of the shoulder in August 1914 causing a complete shattering of the upper two-thirds of the humerus. Infection followed. On September 5 the humeral head was removed as well as the greater part of the diaphysis in the two upper thirds. Some large fragments were left which were not removed until the following May. In June 1915 radiography showed that only the lower third of the humerus remained but there were neoform osseous formations of periosteal origin at the site of the old diaphysis. One of them 7.18 cm long was joined to the inferior fragment. In the superior part another of the same length extended as far as the glenoid. By September 1915 the functions of the shoulder were partly reestablished. There was no important diastasis. By May 1916 with the arm at rest there was a diastasis of about 2 cm. In activity this diastasis disappeared and the shoulder became solid. Active abduction movements up to 45° can be made. Flexion in front is limited but flexion backward is very good. Elbow movement is normal except that extension is limited to 45°.

W. A. BRENNAN.

Imbert, L., L'Héureux, and Roussacroux: Histologic Examination of a Cartilaginous Graft After Seven Months (Examen histologique d'une greffe cartilagineuse datant de 7 mois). *Bull. et Mem. Soc. de chir. d'Alg.* 9 6 xlv, 850.

The examination of a facial graft from which sections were cut after seven months showed that it was in the process of fibrous transformation and that this transformation was almost completely

realized. Any doubt may therefore be disregarded as to the eventual definite solidification of cartilaginous grafts.

W. A. BRENNAN.

Roaring, T. Experiences with Arthroplasty in Severe Ankylosis (Erfahrungen über die Arthroplastik bei schwerer Ankylose). *T. M. Med. Surg. Cong. Goetborg*, 9 6 July.

To relieve ankylosis or to prevent it the author formerly injected vaselina into the joint after the joint membrane was taken care of. This method however can be employed only where the joint capsule is intact and can be saved. Flaps of fascia, as suggested by Murphy in 1894, prevent bony ankylosis. The author tried the method on three knee joints the result was bad in one case. It was successful, however, in two cases of elbow joint ankylosis following fracture and in one hip ankylosis following a septic arthritis a year ago.

In the discussion BERGMAN stated that in the lower extremities the static requirements are the most important and one ought to be satisfied with a correct faulty position. In the upper extremities, however the joints may be mobilized in certain instances. If the shoulder is involved, a pseudoarthrosis at the clavicle is perhaps the most satisfactory. Bergman has mobilized five joints. The result was good in a couple of hand cases but what was gained in mobility was lost in strength. It is very important to follow up the operation with diathermy.

HAGLUND stated that the knee joint should never be mobilized. The ankylosis as a rule begins with the patella and an attempt may be made to mobilize it. He however has had poor results with it.

L. A. JONVIA.

Henderson, M. S. Transplantation of Bone in Fractures. *J. La. et* 916 cvv, 540.

The author reviews the literature of transplantation of bone and of foreign material as outlined by various authors and his conclusion is that if bone is transplanted it should be from the same individual. In this article the author deals principally with the use of bone-grafts for old ununited fractures. The use of the inlay graft rather than the intramedullary graft has been his mode of procedure in the greatest number of cases. Some detail is given as to the method and site of procuring the graft, both after treatment with mechanical dressings.

C. C. CHATTERTON.

Hess, S. L. Transplantation of the Articular End of Bone Including the Epiphyseal Cartilage Line. *Surg. G. and O.* 9 6 xlvii, 301.

In the present article Hess describes the macroscopical and microscopical changes that take place in a growing bone after transplantation. A brief outline and discussion of the literature accompanies the article. The paper is based upon the results obtained in 75 experiments performed upon the metacarpal and metatarsal bones of dogs. In some

of the experiments the epiphyseal cartilage line only is transplanted while in others the accompanying articular end or the entire bone is utilized.

In general he finds that the epiphyseal cartilage line ceases to functionate in all cases after both reimplantation and autotransplantation there being a failure of further longitudinal growth. Microscopically there occurs a progressive degeneration with substitution by fibrous tissue and finally a complete ossification of the epiphyseal cartilage line takes place. The epiphyseal cartilage line is the least transplantable of any of the components of bone.

The articular cartilage undergoes practically no changes after reimplantation while in autotransplantation there is evidence of both degeneration and regeneration. The articular cartilage offers the greatest possibility for successful transplantation of the various components of bone.

The marrow undergoes an early necrosis after which there occurs a fibrous connective tissue change and finally regeneration of some of the marrow elements.

The trabeculae show early evidence of degeneration as noted in the loss of nuclear staining. Then there is noticed a layer of osteoblasts about the periphery which later proliferate and gradually re-form the trabeculae.

The cortex shows an early degeneration after which there takes place a new formation of osseous tissue from both the periosteum and endosteum and a limited amount from about the haversian canals.

The least dependent the part of bone is upon its blood supply the greater is the possibility of a successful transplantation as is the articular cartilage while on the other hand the more dependent the part is upon its vascular connections the less likely is the possibility of a successful transplantation as is the epiphyseal cartilage line.

Haas concludes that in spite of the fact that each part of transplanted bone can regenerate independently and without any aid from the host some additional factor either in the form of a chemical or a physiological stimulus or even some definite osseous elements from the host are essential for the continued life of the transplant. Although function may play a part in the process it is not of prime importance.

Schaldemose, V: Weight Bearing Amputation Stumps (Ueber tragfähige Amputationenstümpfe). *Tr. N. Y. North Surg. Cong. Goeteborg* 1906 July.

As shown by Hirsch amputation stumps can be made weight bearing by means of baths, massage, and stepping exercises. The author employed Hirsch's principle in ten cases of leg amputation but simplified the method. He performed a simple amputation with a large posterior musculocutaneous flap and division of the periosteum and bone at the same level suture in two layers and a small drain from the corners of the wound, removed on the fourth day. On the tenth to twelfth day stepping exercises are begun first in bed later

with the patient sitting down. The unpleasant sensations are soon overcome. In the third to the sixth week a provisional prosthesis made of wood and plaster of Paris is applied and after the second or third month the final one. All ten patients are now walking directly upon the stump.

L. A. JUTIKKE.

ORTHOPEDICS IN GENERAL

Taylor H. L. The Standardization of Conditions Affecting Posture. *Am. J. Orth. Surg.* 1916 xiv 569.

The author's report is based on the work of the American Posture League during the past three years. He describes in detail the principles of correct sitting. After much study and experimentation a model was officially approved by the League and seats of this type are now in use on the Brooklyn subway. A standard school chair was remodeled by the furniture committee to conform to hygienic standards and has proved very satisfactory in actual use. Kindergarten and vocational chairs have been designed and tested. Work is now under way on office chairs and will soon be started on industrial and auditorium seating.

It was found that boys ready made coats were being made over round backed models and were therefore too loose at the back and too tight across the chest pulling the shoulders forward and virtually compelling a round back posture. The matter was taken up with a large manufacturer and coats were remodeled to a correct design. Shoes of three types — unflared straight and outflared — have been made and tested and will soon be on the market.

PHILIP LEWIS.

Bogue E. A. A Prosthetic Appliance to Replace a Necrosed Shoulder Joint. *Am. J. Surg.* 1916 xxx 366.

An apparatus to replace a necrosed shoulder joint was made of vulcanized rubber mounted with platinum attached by screws to the shaft of the humerus and the scapula the head of the device having the movements of a ball and socket joint. The apparatus was enclosed in periosteum and bone proliferation took place around it. The patient is said to have been able to use the arm almost normally.

H. W. WILCOX.

Parker G. A. A Plea for the Prevention of Deformities in the Healing of Burns. *J. Am. M. Ass.* 1916 lxxvi 565.

In the treatment of burns of the third degree burns destroying the skin but leaving the deeper structures intact Parker aims to prevent deformity by fixation of the joint during the process of healing and for sometime thereafter to prevent subsequent contracture. The elbow, wrist, fingers, hip, knee and toes should be kept extended the arm should be abducted and the foot should be at right

angles. The use of removable plaster casts to facilitate dressings is most advisable.

For the treatment of the burn itself Parker applies overlapping ribbons of adhesive plaster directly to the wound, extending some distance beyond the margins of the burn for attachment to normal skin. This is done after all sloughs have separated, and the adhesive is changed two or three times a week. This adhesive dressing prevents exuberant granulations, reduces the amount of secretion by its influence on osmosis and conserves the heat and moisture. A dressing of dry gauze is placed over the adhesive and is to be changed daily. There is no pain on removal of the dressing and the zinc oxide serves even better than the popular wet dressings.

ROBERT C. PALM

Frisling, G. Two Cases of Coxa Valga. *Arch. Surg.* 1917, 64, 101. (Cited by G. C. S. Goetborg, 9, 6, July)

In both cases reported there was an epiphyseal separation shown by the X-ray picture — one case bilateral, the other unilateral. The treatment consisted of reposition and application of a plastic cast in the corrected position.

HAGLUND discussed the biological significance of coxa valga. In his opinion the neck angle is not dependent upon the static weight-bearing but is determined in intra-uterine life by the muscular relationship. L. A. JURYAK.

Buelow-Hansen, von. Osteotomy Especially in Coxa Vara. (*Ueber Osteotomie besonders bei Coxa Vara*). *Arch. Surg.* 1917, 64, 102. (Cited by G. C. S. Goetborg, 9, 6, July)

The author demonstrated cases of osteotomy in coxa vara, pes varus, and pes valgus in which good results were obtained.

GIERSTADT mentioned a case of coxa vara which was treated with tenotomy and osteotomy with good result. L. A. JURYAK.

Jones, R. Disabilities of the Knee-Joint. *Br. J. Surg.* 1917, 4, 103.

The author classifies the injuries to the knee and outlines treatment for the various lesions.

For sprain of the internal lateral ligament, distinguished by pain and tenderness over the inside of the knee, especially at the attachments of the ligament, he straps the knee firmly and raises the inner side of the shoe heel in order to divert the body weight to the outside and relieve tension on the inner side of the knee.

The inner semilunar cartilage is closely connected with the internal lateral ligament and in severe twists the cartilage may be pulled loose with rupture of the ligament. Diagnostic points are distention with fluid, pain on the inner side of the knee and tenderness, especially at a point just inside the patellar ligament over the border of the tibia.

The knee should be extended on a posterior splint

for ten days, after which walking is allowed with a firm bandage over the knee to prevent effusion. After such a cartilage lesion there is sometimes an overgrowth of cicatricial tissue anteriorly which may become pinched in the joint and necessitate operation for its removal.

A completely displaced cartilage, indicated by locking of the joint, may be reduced by placing the patient on his back, the thigh flexed on the body and the knee flexed on the thigh, then while the patient voluntarily and forcibly extends the leg or kicks, the surgeon pulls on the foot and rotates it inward. The leg is then held in extension for ten days after which the patient walks with a firm bandage on the knee. If the cartilage continues to give trouble it should be removed. With the knee flexed, on the edge of the operating table, transverse incision is made over the anterior end of the cartilage, enough inward to avoid the lateral ligament. A fringe of cartilage must be left as it will cause continuance of the symptoms. The author has treated over 2,000 of these cases. The shortest time to rest in immobilization is six weeks, followed by massage and gradual bending begun.

Rupture of the usual ligaments may occur with fracture of the spine of the tibia. If the tibia cannot be displaced forward while extended one may be assured that the anterior ligament is not completely torn, and if it cannot be displaced backward while flexed the posterior ligament is presumably not ruptured. Abnormal mobility in these directions indicates an elongation or rupture of the corresponding ligament. It is useless to attempt to suture the ligaments. The knee should be fixed in a cast or splint long enough to permit the formation of a healing cicatrix.

Fracture of the spine of the tibia is indicated by a rigid obstruction preventing full extension but should be verified by roentgen ray examination. If the fragment can be manipulated back between the condyles by fully extending the knee, manipulation with traction is all that is necessary, but if the knee cannot be fully extended the fragments must be removed by operation.

Swelling of the retropatellar fat pad may follow any knee injury and give rise to symptoms by being caught in the joint on full extension. In such cases a cork under the heel or a brace, either of which will prevent full extension, should be worn until the swelling disappears. W. A. CLARK.

Wallace, C. Orthopedic Observation in the Treatment of Anterior Polymyositis. *Arch. Pediatr.* 1917, 34, 599.

The author reports on a study of about three hundred cases of infantile paralysis which occurred during the epidemic of 1907 treated at the Hospital for Ruptured and Crippled and the subsequent histories obtained.

Among the interesting points noted are the following:

- 1 Twenty five patients made a complete recovery and are classed as abortive
- 2 The disease reached its height during August
- 3 The age incidence of the attack was greatest between one and two years
4. Permanent paralysis of some muscles of the lower extremity occurred in 84 per cent

Almost all patients who survive an acute attack present mechanical problems almost from the beginning.

The orthopedic treatment of the acute stage should be directed toward the relief of pain and the prevention of the passage of nerve impulses to the affected nerve-cells, and this is accomplished by rest and immobilization in plaster-of-Paris dressings.

In the stage of paralysis rest in bed for two or three months with alcohol rubs and hot fomentations or baths is recommended. All attempts at movement especially sitting up are restricted and any tendency to contractures from overuse of muscle groups should be combated.

During the period of convalescence, that is, after the patient begins to walk, muscle balance should be secured and maintained and the paralyzed muscles stimulated by massage manipulation and stretching.

Braces have a large place in the treatment during this period as they favor functional use. Conservative treatment along these lines will obviate the necessity of operative correction of deformities later on in life in a large percentage of cases.

H W WILCOX

Ashley D D: Shoes, Physiological and Therapeutic. *N Y M J* 1916 21 241

This is a valuable contribution to the too poorly understood subject of correct footwear. The author considers first the requirements of a shoe for a normal foot and points out the common faults found in ordinary trade shoes.

He next considers the therapeutic shoe modified to meet the symptoms of mechanical strain weakness, and disease. Especial stress is laid upon the fact that many disabilities of the foot are traceable to the faulty construction of the heel of the shoe and

to a too rigid heel seat. The heel is commonly too high with a slope forward so that the front of the foot is crowded into the toe of the shoe thus favoring hallux valgus hammer toe corns and bunions. He advocates the selection of a good trade shoe modified as needed in preference to a custom made shoe. Children's shoes which approach the physiological outline are readily obtained the manufacture of men's shoes of the right shape is increasing but women's shoes of the proper type are difficult to obtain.

H W WILCOX

Lovett R W: A Plan of Treatment in Infantile Paralysis. *J Am M Ass* 1916 LVIII 431

Lovett reviews the prime essentials in the treatment by dividing the course of the disease into three stages: (1) the acute or stage of onset (2) the phase of convalescence and (3) the stationary stage.

Under the first stage the important points are absolute rest until the muscle tenderness has disappeared and the prevention of deformities by proper supportive measures to the affected muscles. Scoliosis is warned against and is frequently overlooked at this time.

The second stage usually lasts about two years and during this period the restoration of the maximum function of the affected muscles is most important and here prolonged muscle training under intelligent supervision is needed. Lovett warns against too long recumbency. The patient should be gotten up as soon as the first stage is over and if there is any tendency to deformity it should be corrected by the use of retention apparatus. The author's experience with the various forms of electricity does not justify its use. Massage has its limit in the stimulation of circulation and local heat is of equal value. Underuse of the affected muscles is preferable to overuse, which may do a great deal of permanent injury.

In the third stage the operative field of tendon transplantation and fixation, astragelectomy the use of silk ligaments, and arthrodesis are discussed with their various indications and results. The silk ligaments have been used by Lovett with fair success.

CURTIS LEE HALL

SURGERY OF THE SPINAL COLUMN AND CORD

Ridlon, J. Two Cases of Scoliosis Accompanied by Pressure Paralysis of the Lower Limbs. *J Am M Ass* 1916 LVIII 803

The association of a motor spastic paralysis of the legs with scoliosis is regarded by the author as unique.

One case occurred in a well-developed girl of eleven who had a left dorsal right lumbar curvature with marked rotation. Two years after the first observation she developed a spasticity of the legs with exaggerated reflexes and loss of sphincter con-

trol. Roentgen pictures at this time showed wedging of the vertebra anteriorly and to the right. Neurological examination showed no disturbance of sensation no evidence of cranial nerve palsy normal eye-grounds upper limbs normal lower limbs showed greatly exaggerated knee jerks ankle clonus and positive Babinski on both sides. The neurologist's opinion was that there was pressure on the cord in the region of the dorsal bend. After four months treatment on a Bradford frame she showed improvement reflexes and ataxia diminished and

Babinski negati ve. Another neurologist's opinion at this time was that a secondary cord compression had resulted from the vertebral deformity.

The other case was a girl 16 who had a spina bifida at birth and was retarded in development. A left curvature of the spine was first noticed when she was seven. At fourteen she began to lose strength especially in the legs and finally became completely paralyzed in the legs. Roentgen pictures showed destruction of four of the dorsal vertebral bodies from the fourth to the seventh but this did not appear to be due to tuberculosis. After six months she showed some improvement but was far from complete recovery. W. A. CLARK.

Paul W. E. Epidural Intraspinal Tumor of Two Years Duration. *Bull. J. Ch. S. F.* 90: 475, 1913.

The author reports a case of intraspinal tumor not associated with pain, and calls attention to a plea made by Collins and Marks that the term atypical be discarded from the symptomatology of cord tumors. Painlessly advancing tumors are not atypical. They form a distinct and important group more significant because less tangible than classical series.

The principal features of the author's case were numbness, loss of heat sense, preservation of sense of touch, later the gait became ataxic and Babinski sign was positive. At first it was thought to be a case of syringomyelia, but ultimately the degree of spinal impairment combined with change in the sensory level suggested the suspicion of tumor and a laminectomy was advised.

At operation tumor presented at the fifth lumbar

level, irregular in outline, measuring 4 by 2 cm. and shown microscopically to be a fibrosarcoma. The patient made a perfect operative and functional recovery. D. L. DUFF, MD.

Van Zwaluwenburg, J. G. Anomalies of the Fifth Lumbar in Relation to Backache. *J. Mich. St. U. S.* 9: 65, 1918.

The author calls attention to the variability of the structure of the fifth lumbar vertebra as to size and position, the relation to the level of the iliac crest, its inclination to the vertical axis and in the planes of the posterior articulations. He emphasizes the changes in form and size in lateral processes when they are elongated, truncated, flattened off or otherwise shaped to conform with adjacent lateral bodies of the sacrum. At times they even present an articulation with the opposing surface. The posterior articular process may show many changes.

When this body shows evidence of inflammatory change, such as obscure articulations and tipping of the margins, the condition is called sacralization of the fifth lumbar vertebra. The abnormal weight-bearing of the spine in these conditions is discussed, and strain symptoms caused by the condition are carefully gone into. He believes the rational treatment rests on mechanical support. Operations are difficult in this region and seem to the author exceedingly dangerous because of resulting paralysis and unjustified because of the tendency to unbalance a structure already suffering from mechanical weakness. He believes the best treatment will be control of motion or fixation of the affected parts. C. C. CHITTERTON.

SURGERY OF THE NERVOUS SYSTEM

Ingebrigtsen, R. Experimental Investigations Regarding Free Transplantation of Peripheral Nerves. (Experimentale Undersøgelser over frie Transplantation af periferer Nerven). *Tidsskr. Nord. Selsk. C.* 19: 1, Goeteborg, 1916, July.

Experiments on rabbits have shown that in heteroplastic transplantations a complete necrosis of the transplanted nerve occurs within twelve to fourteen days, whereas homologous autoplastic transplantations show that even though a Wallerian degeneration occurs there is nevertheless a proliferation of Schwann's cells as proof of life in the transplant. The returning was done with a vaselined silk thread and the point of suture was rubbed with vaseline but not covered. Following autoplastic nerve transplantation on rabbits numerous proliferations of nerve fibrils from the central end were observed and the transplant acts as a passive splint for the growing fibers. One hundred days after the operation an electrical examination gave positive results and the animals had normal locomotion.

The method certainly deserves a place in the clinical treatment of nerve defects. In the literature there are reported 32 cases of nerve-transplantation — only 2 in the last 10 years. Dean employed the sensory portion of the radial nerve of the forearm to cover a defect in the radial nerve of the upper arm and obtained a good result. The author recommends the use of the intercostal nerves which are very thick and can easily be sutured.

L. A. JENSEN.

Saint Martin, E. Some Cases of Caoutchouc Grafts. (Note sur quelques cas de greffes de caoutchouc). *Bull. et mémoires Soc. de chir. de Paris* 1916, 2: 568.

Saint Martin has used caoutchouc for isolation tubes in cases of liberated nerves, and such tubes have been perfectly tolerated. In a case where a testicle was replaced by a small ball of black caoutchouc the size of a normal testicle sub-

sequent to castration and without the patient's knowledge the ball was perfectly tolerated and two months later the patient was rid of all anxiety regarding the loss.

However in seven attempts to consolidate the wall by sponges of caoutchouc in loops of inguinal

hernia, all failed. The fragments of caoutchouc were either removed or eliminated.

The author is of the opinion that Fieschi's method should not be condemned as he attributes the failures to the bad quality and defective sterilization of the sponges employed.

W. A. BRENNAN

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS ABSCESSSES ETC.

Clark J. C. Phases of the Cancer Problem. *J. M. Soc. A. J.* 1916 xlii, 461

The cancer problem is discussed from the standpoint of the laity and a report made of the use of radium in carcinoma of the uterus. The author holds that in the early recognition and treatment of cancer lies the hope of a cure. This is the motto adopted by the American Society for the Control of Cancer. He lays special emphasis on the treatment of ulcerated areas which have not healed promptly. Cancer is primarily a local disease. He thinks that the profession will in a short time be held responsible if they advise delay in a case of questionable growth. He does not believe that heredity plays any part in its development.

Clark has found that in treating cancer of the cervix with radium of 100-milligram doses that his end results are much better than the stay in the hospital is considerably shortened and that owing to the knowledge of the sad experience that others have had with the dosage they have been able to avoid such results. He believes that no operation should be done on a cancer case previously treated by radium.

Removal of the uterus in cases of cancer of the fundus has yielded such good results that the author does not feel justified in taking any chances with radium. In borderline cases of cancer of the cervix he employs radium. In doubtful cases of cancer of the fundus he invariably performs a hysterectomy. As a palliative agent the author feels that he has never obtained results with any other method that have approached in beneficence those secured by radium. The cloud however that hangs over radium treatment is the danger of unbridled optimism.

HARRY G. SLOAN

Helfmann, W. J. Precancerous Dermatoses. *J. Cancer Research*, 1916 1 343

The author protests against the use of the term precancerous as applied to dermatoses. He compares the microscopic pictures found in various dermatoses that are usually called precancerous with the pictures of sections where cancer has already developed and finds them to be identical. Of all the conditions called precancerous xeroderma pigmentosum is the only one which invariably is.

The author insists that precancerous is the wrong term to apply to any dermatosis because of the fact that cancer does not develop in a large proportion of them. He suggests that the use of the term dermatosis be modified with the statement that the tendency is very strong that cancer will occur.

HARRY G. SLOAN

Grubbe E. H. One Hundred Thirty nine Cases of Skin Cancer Cured by X Rays. *Clinique* Chicago 1916 xxxvii 389

The author considers a proper selection of cases a prime essential for a fair estimate of the value of roentgen treatment in skin cancers. He regards as ideal cases those in which the lesion is primary in the skin or mucous membrane in which no metastases are present and which have not yet extended to the submucous structures. He believes in giving massive doses, enough to produce decided inflammatory reaction to secure best results. He prefers soft tubes backing up an x to 3 inch spark.

In this paper he confines himself to a consideration of 135 uncomplicated cases which he has treated exclusively by the roentgen ray. Practically all of these were confirmed as to diagnosis by microscopic examination. 130 of them were clinically cured, remaining free from recurrence from one to fourteen years. The remaining 5 were either lost sight of or died from some intercurrent disease or accident. The abridged histories of a number of typical cases are included as evidence of the efficacy of the treatment.

In conclusion Grubbe states that in view of the lessened frequency of recurrence after this treatment the decreased tendency to metastases inasmuch as no blood vessels are opened up for the spread of cancer-cells and as it is a simple, safe, painless non-confining and non-disfiguring treatment it should be used in every case of uncomplicated skin cancer.

ADOLPH HARTUNG.

Regaud C. and Nogler T. Clinical Histologic, and Radiologic History of a Myxosarcoma Treated by the X Rays (Histoire clinique histologique et radiologique d'un myxosarcome traité par les rayons x). *J. de radiol.* 1916 II, 135

The authors refer to a previous series of experimental researches carried out by them on the testicle in which they were convinced of the impossibility of curing by radio-sterilization. By improving the

technique employing stronger doses and more penetrative rays, they believed that they had arrived at a method of treating human malignant tumors with a guarantee of innocuity and an encouraging prospect of success. Under the improved technique they treated from 1911 to 1914 a large number of such tumors, and obtained remarkable regression and even apparent cure but in only rare cases did they succeed in curing a cancer outside the skin region.

An analysis of these observations shows many reasons for failure in the use of the X rays, but one of the most important was quite unexpected. This is that the radiosensibility of a tumor to the X rays diminishes according as it is subjected to successive doses and sometimes in a striking way.

A detailed history is given of the X ray treatment of a myxosarcoma situated in the right temporoparietal region in a girl of twelve years. The sarcoma ulcerous and inoperable was subjected to 11 X ray treatments. The first two treatments produced considerable diminution in the size of the tumor but the later treatment produced no result. It was evident that the radiosensibility of the tumor was not constantly maintained.

In the authors opinion diminution of radiosensibility is explainable by an auto-immunization of the neoplastic cells against the effects of the ray. This immunization is conditional on humoral modification due to the resorption of the waste of necrobiotic cells.

The theory and current practice of radiotherapy indicate that the treatment of a malignant tumor by the X rays should be in successive applications, these being of weak or moderate intensity. Experience has shown that this fragmental disposition of the dosage has no appreciable drawbacks and notably so in skin neoplasms. But in other cases fragmentation of the dosage is a disorganizing procedure because it permits auto-immunization of the neoplasm against the rays. This is so in voluminous breast cancers, spinocellular epitheliomas of the skin, and in certain sarcomata, such as the one now reported.

Therefore, whenever the superficial position the thinness and the radiosensibility of a tumor gives hope for its radical cure by a single intense application of the X rays, this method seems preferable to fractional doses. However in the case of voluminous neoplasms this procedure runs the risk of being inefficient and dangerous, and hence the authors suggest a combination of surgery with radiotherapy as follows:

1. A simple intense irradiation calculated to produce a homogeneous effect throughout the mass of the tumor.

2. Immediately after this surgical curettage of all the neoplastic tissue. After a suitable time has elapsed after the first intervention, re-application of radiotherapy.

This technique meets the following ends:

Suppression of intoxication and auto-immunization phenomena by removal of the irradiated tissue before its resorption.

3. Guarantee against metastases by the vascular channels resulting from the complete sterilization of the neoplastic cell before surgical operation.

4. Preparation of the neoplastic region for ulterior efficacious radiotherapeutic treatment by the removal of all viable parts of the neoplasm.

5. Prophylaxis of recurrence by postoperative treatments.

W. A. BAKER

SERA, VACCINES, AND FERMENTS

Krotoszyner M. The Serodiagnostics of Gonorrhoea.

Calif. J. Med. 9: 63-81, 1915

The author decided to verify or refute contradictory views upon the mooted points by trying out the test upon 100 individuals.

The test was made by means of several polyvalent antigens M. N. Hirschfelder and that prepared at the laboratory of Drs. Gilman and Johnson.

According to the author the most important drawback to the utility of the test lies in the difference in the preparation and efficacy of the antigen. Another source of discrepancy in reactions may be looked for in the difference of preparing the antigen. In running his series examined with 100 antigens the positive result were uniformly one plus higher with Hirschfelders than with M. N. S. antigen.

With regard to matrimony in connection with gonorrhoea, the test may occasionally add confusion instead of enlightenment. In two candidates for matrimony with former history of gonorrhoea and no clinical finding the complement fixation test was three plus positive and the author feels that some of these individuals must be considered chronic gonococci-carriers.

The test whilst of great value in very frequent cases of chronic prostatitis on the basis of gonorrhoeal antecedent and in these cases positive reaction is, especially in connection with the marriage question, to be considered a strict indication to postponement of the step and to vigorous local and vaccine treatment. The best results were obtained in cases of from six months to three years standing.

The author convinced that the complement fixation test for gonorrhoea if used and interpreted in connection with the clinical findings, furnishes a valuable aid to the diagnosis of latent gonorrhoea.

LOUIS GROSS

Leclainch and Vallée. Specific Serum Treatment of Wounds. (Traitement sérique spécifique des plaies.) *Bull. et mém. Soc. d'hydr. et P.* 9: 6, 1915, 364.

Quenu, who submitted this report recalled the historical progress of the therapeutic method of Le-

clanche and Vallée since their first researches in 1907. These authors, in their researches undertook a double therapeutic problem.

1 In the treatment of infected wounds they tried to favorably influence the local defense of the tissues by neutralization of the microbial germs especially streptococci, staphylococci and the pyocyanic germs as well as their toxins by means of a serum containing the specific antibodies of these microbial species.

2 Starting from a basis of facts solidly acquired in veterinary medicine regarding immunization against a vibronary form of gangrene, they believed that they could also immunize wounded against gaseous gangrene and they consequently planned a preventive serotherapeutic treatment against gaseous gangrene.

The authors' polyvalent serum treatment as put in practice is a purely local curative treatment which consists in placing the polyvalent serum in direct contact with the diseased surface by means of dressings, inhibition appliances or injections into cavities. A number of reports are submitted from various investigators who have used the serum. These reports are grouped under the headings (1) local treatment of infected wounds (2) treatment of badly infected wounds with serum either hypodermatically or intravenously and with or without local treatment.

Regarding wounds of the soft parts without bone lesions local applications of serum show generally a considerable diminution of suppuration and a great activity in the dermatization of the edges of the wounds. There is much diversity of opinion however as to the exact action of the serum on the microbes. In wounds with osseous lesions the results obtained by surgeons were generally good. The subcutaneous or intravenous injection of serum in the case of infected wounds or septicæmia while it can not replace surgical intervention is capable of rendering such intervention efficacious.

Quéan in commenting on these reports asks what place ought to be given polyvalent serum in the treatment of infected wounds. In what manner does it modify the indications of surgery? He thinks that every new method which shows some success has a tendency to free itself from the restrictions imposed by clinical necessities. Thus the early followers of the Carrel method thought they could, without danger, reduce the amount of clearance in wounds. One who followed this procedure had very deplorable results in 20 cases treated, 3 deaths, 4 amputations, 5 stationary and 8 cured.

The mechanical early and complete clearance of the wound is essential to success.

Polyvalent serum is not an antiseptic. It does not kill the microbe; its action is neutralizing by favoring microbe enemies by neutralizing toxins and by facilitating the proliferation of reparatory tissue. Serum is not a direct combatant of infection, but an auxiliary.

Therefore it is not astonishing that wounds treated by polyvalent serum should still contain microbes sometimes abundantly even when the local and general state shows distinct improvement. What ever may be the mode in which the serum acts this mode of action implies the necessity of direct contact with the injured tissues. Its action therefore will be favored by operative procedures which open up and expose these tissues as much as possible and by the surgical removal of foreign bodies or debris. Surgical action gives a maximum value to the effects of useful solutions and especially to that of polyvalent serum.

Regarding the failures of serotherapy it is well known that the antibodies necessary for defense must be specific not alone against the species, but against the microbial genus. In all attempts at immunization therefore with the use of such complex injections there must be a great deal of speculation. On account of such contingencies a close alliance is necessary between the clinic and the laboratory. The fact that some observations show contra-indications or failures does not imply that serotherapy is a failure or detract in any way from the results already obtained from it.

In the case of old wounds with or without septicæmia, Quéan thinks that, while experience is sufficient to attest the fact that polyvalent serum ought to be included in the means at disposal against infection, it is not yet sufficient to formulate precise rules to be laid down with regard to the indications for its employment more clinical experience is necessary.

The task of arriving at a definite conclusion as to the value of the method is rendered more difficult by the inequality of the observations submitted by the small number of truly scientific observations and by the lack of organization in the carrying out of experiments. The same applies to the attempts made to use polyvalent serum as a preventive of gaseous gangrene.

W. A. BRENNAN

BLOOD

Fralick, W. G.: Induced Leucocytosis as an Aid to Surgery. *Med Times* 1916 xlv 249

The data of 12 cases is reported. In 9 of them digitalis was administered orally over a period of time which did not exceed four weeks. In 3 of the cases digitalis (1 cc.) was given intravenously in one of which the second count was made one hour after the injection. In 8 of the cases the patients were under treatment for ailments which seemed to contra-indicate the exhibition of an anæsthetic until after the results produced in them by the digitalis treatment.

The increase of the number of leucocytes observed in the cases was as follows:

OAL ADMINISTRATION

| Case | Time | Total leucocytes | Increase of leucocytes | Percentage increase of leucocytes | Polynuclear leucocytes | Increase of polynuclear leucocytes | Percentage increase of polynuclear leucocytes |
|-------|------|------------------|------------------------|-----------------------------------|------------------------|------------------------------------|---|
| | | | | | | | |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |

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| | | | | | | | |
|-------|------|------|------|------|------|------|------|
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| After | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |

There was neither an increase nor decrease of the leucocytes in case 7 nor in case 9 after two weeks medication.

LEWIS L. COYNE

Dearborn, G. V. Some Practical Notes on Blood Pressure. *Med. R.* 96: 487.

Attention is called to the many pitfalls in reading blood pressure as usually taken by the ordinary physician.

Blood pressure measurement as they are taken at present by the joints of the apparatus is are likely to be more misleading than significant. It only by repeating the measurement each minute (or each two minutes) for a half hour. In several successive days care being taken in later pretation to a well known source of high pressure that one is likely of having a significant set of measurements.

The author has divided his blood pressures into nine groups. He gives the following conclusions therefrom which are that:

1. Blood pressure raised by 10 or of unpleasantness and not only by anxiety.

2. In some cases but by no means all it appears to be lowered by all relaxing pleasant feelings and pleasurable sensations.

3. It is raised by 11 abnormal brain action especially by the voluntary work of the entire organism.

4. The blood pressure appears to be an indicator of anxiety in the person mind conscious or unconscious, and may be so used to some extent for diagnostic purposes in psychopathology etc.

5. The blood pressure is in general a variable in adults as in child in fact the widest normal variation the author ever noted occurred in an individual apparently normal, who was approaching the age of 60.

6. There is a marked degree of reciprocity between different parts of the body.

7. The diastolic is as variable, in many cases as is the systolic pressure.

8. The deliberate relaxation of the voluntary muscles readily and greatly lowers the pressure.

9. There are evidences of the frequency of a vasomotor neurosis whose pressure effect is great

and lasting enough to thoroughly mislead the clinician who mistakes it for the anticipation of a nephritis, for arteriosclerosis or for a sign of gout or of Raynaud disease. Low blood-pressure seldom has any more sinister significance than has low heart rate.

There are frequent suggestions especially in the diastolic records, of rhythmic pressure variation of from 5 to 3 millimeters, in waves from 10 to 3 minutes long. To overcome these variations as much as possible the following suggestions are made:

1. Twenty minutes instead of one should be used in determining blood pressure and the procedure should be carried out on several days in the case of one day only as is the common custom.

2. No one should interpret any measurement of the blood pressure as an algebraic balance of the doses of salt and modifiers.

3. A patient must not be acutely anxious or scared. He must not be allowed to worry about anything for anything gives the blood-pressure and may be sustained indefinitely.

4. Keep mind the frequent occurrence in persons of chronic nephritis of pressure vasomotor neurosis or at least something that acts like one.

LEWIS L. COYNE

Cadbury W. B.: Studies in Blood Pressure, with Special Reference to Diastolic and Pulse-Pressure Readings. *Ch. J. Med.* 96: 1711.

The purpose of the present paper is to emphasize the absolute distinction between diastolic and pulse pressure readings. The material forming the basis of this study consists of the hospital records of 305 patients who entered the medical service of the Peter Bent Brigham Hospital during the years 1913, 1914 and 1915. These 305 patients were selected from the first 3,000 admissions to the wards but 11 of those who had at least one reading of systolic pressure of 60 mm of mercury or more and in whom at least two tests of the pressure were made. Since it is customary to make two or more tests of the blood pressure in all medical cases showing hypertension or hypotension, and since at least one test is made of every patient admitted, the author's study comprises very early all the cases of hypertension seen in the medical service during these three years. The Fought mercury manometer instrument was used in this work and the readings were made by the auscultatory method. From his study the author concludes as follows:

In the wards of a general hospital hypertension occurs almost as frequently in females as in males.

2. About 68 per cent of cases of hypertension are found in patients between 40 and 60 years of age, the greatest number occurring between the ages of 50 and 59 years.

3. Almost three-fourths of the cases, 78 per

cent had definite signs of chronic nephritis. Arteriosclerosis was also common. The next most common conditions were circulatory disturbances, chronic myocarditis, or valvular lesions.

4. If several specimens of urine are examined, albumin is usually to be found at some time in cases of hypertension. If it is persistently absent, the cause of the high blood pressure is generally vascular or cardiac disease and not renal.

5. The readings of the phenolsulphonphthalein test vary inversely with the average systolic and diastolic readings, this ratio being especially noticeable in diastolic readings.

6. The blood urea nitrogen varies directly with the average systolic and diastolic readings.

7. In hypertension cases with a normal heart load of 40 to 60 per cent, 85 per cent had chronic nephritis. Of those cases in which the load was under 40 or over 60 per cent, only about 10 per cent were cases of nephritis. When the load was under 40 per cent, the prognosis proved to be most unfavorable, but there were several cases without signs of cardiac decompensation. Among those whose heart load was 40 to 60 per cent, only 28 per cent gave signs of cardiac decompensation; of those whose heart load was 61 to 99 per cent, there were 59 per cent with cardiac decompensation, and of those whose load was 100 per cent or more, 66 per cent showed signs of cardiac decompensation. Hypertrophy of the heart without decompensation was most common in cases with a normal load, when the load was 100 per cent or over, there were the fewest cases of heart hypertrophy without decompensation and the greatest number of decompensated hearts.

8. Subnormal diastolic pressures suggest the presence of aortic regurgitation and the absence of chronic nephritis. With the rise in diastolic pressure, the incidence of aortic regurgitation rapidly decreased and the percentage of nephritis steadily increased, much more consistently than when the systolic pressure alone was examined.

9. During the hospital treatment, there was usually a decrease in the systolic, diastolic, and pulse pressures, but this was more frequent with the systolic than with the diastolic or pulse-pressure. The pressures may rise or remain about the same.

10. In cardiac decompensation, the effect of digitals was rather to increase pulse pressure and systolic pressure and cause a fall in the diastolic pressure.

11. Deaths in hypertension patients most frequently occurred between the ages of 40 and 60 years, and the underlying condition was either chronic nephritis or chronic disease of the heart, or a combination of the two. More than half the deaths occurred with symptoms of uræmia or apoplexy. Twenty-eight per cent died with signs of progressive heart failure. The patients in more than half the fatal cases had had a systolic pressure of over 200 mm. and 86 per cent had had diastolic pressure of over 100 mm.

GEORGE E. BIRLEY

Tunnell, F. W. and Stebbing, G. F.: The Intravenous Injection of Oxygen Gas as a Therapeutic Measure. *Lancet* Lond. 1916 cxd 321

Experiments have been carried out repeatedly upon animals to show the effect of intravenous injection of oxygen. The authors' work was done wholly upon man and the series includes several desperate cases with marked cyanosis. He found that from 500 to 1,000 ccm. of oxygen can be introduced into the veins at the rate of from 600 to 1,200 ccm. per hour. Cyanosis and dyspnoea are rapidly relieved. The rate usually used was 500 ccm. per hour. The more cyanosed the better is a rapid rate tolerated. The object of the paper is merely to point out the possibility of this method as a therapeutic agent. J. H. SKILES.

Barclay and Clermont: Arterial Contractility and Stovaine in Connection with Blood Transfusion (A propos de la transfusion du sang contractilité artérielle et stovain). *Presse Méd.* 1916 p. 425

Both in man and in animals the radial artery, on account of its anatomic constitution, very easily contracts under the influence of the mechanical excitation produced by its denudation in blood-transfusions, etc. In blood transfusions the valuation of the sanguinary withdrawal depends on many factors, such as the dimensions of the artery, the arterial pressure, and the intensity of the arterial pulsations.

Barclay and Clermont propose to utilize the vasodilatory action of stovaine in overcoming the vasoconstrictor reflex of the radial artery. Experiments made by treating the arterial wall with a stovaine solution of 1:20 showed that there was a disappearance of constriction and the arterial diameter resumed its normal dimensions, pulsations were clearly felt and the blood flow regular. Clinically these results have been verified in two transfusions done in the ambulance service. The method according to the author is simple and is capable of reducing the measurement of withdrawals in blood transfusions to a regular and uniform method.

W. A. BRECKENAM

BLOOD AND LYMPH VESSELS

Gebele: Aneurysms Due to Gunshot Injuries (Ueber Aneurysmen durch Schussverletzungen). *Beitr. z. kl. Chir.* 1916 c. *Kriegschr. Hef.* 35

In the Franco-German War of 1870-71 there were reports of only 44 gunshot injury aneurysms on the German side. In the Russo-Japanese War 88 cases were reported. In the war of 1912-13, there were 105 cases in the Serbian army. In April 1915 Bler at Brussels reported on 102 aneurysms observed in the present war, 100 of which had been previously reported.

Gebele now reports on 12 cases of aneurysms observed by him in the Reserve Hospital at Munich from October 1914 to January 1916 and reviews the treatment of war aneurysms at length. Clinical

details of his cases are given. Seven of Gebele's cases were treated by ligature and 5 by suture of vessels, 3 of the latter being lateral and 2 circular aneurisms. There was one vein-transplantation. Of the operated cases 8 were rendered fit for service, 2 became unfit, 3 cases (one of which was an absolutely hopeless case) died. The ligatures were not followed by gangrene.

Vascular suture is the ideal operation and is the treatment of choice in gunshot aneurisms if fitness for future service is to be expected. Fitness is only to be expected in a lesser degree after ligature. Unfortunately vessel suture cannot always be executed. In infection suture is contra-indicated because of the danger of thrombosis and secondary hemorrhage to which Bier, von Bonin, Hott and others also refer. In such cases ligature is advised. Ligature is permissible in smaller vessels in which the interruption of the circulation is without danger. Bier has drawn rather narrow limits to this concerning the procedure in the A. temporalis, the A. occipitalis, the A. ulnaris and the A. tibialis ant. & post. Hott however asserts its limit and includes the carotis externa, the meningea media, the truncus thyrocervicalis, the subclavia and peronea. With regard to ligatures at the site of the injury when there is an acute hemorrhage Hott has recommended in such cases probing of the vessels in the periphery of the tumor clamping reopening of the same and exposure of the vascular injury. If branches communicate within the temporary compression hemorrhage continues. Then digital compression within the aneurism is necessary and suture ligature indicated.

In acute hemorrhage Bier recommends suturing of the bleeding wound tamponade of open lacerations, suture of the surface wound and compression bandage. The primary staunching of the blood must be the final one that is, suture of the vessel must follow immediately. In aneurisms one should never be satisfied with ligature on the affected spot. In a vital hemorrhage ligature is only the primary act of definite blood staunching. Thus Gebele has observed a mortal hemorrhage from an aneurism of the carotis externa in spite of its being ligated. He considers that the extirpation of the sac in old aneurisms is necessary if thereby nerve adhesions and nerve paralysis can be obviated.

There is no certain criterion of collateral circulation. According to Moskowitz, collateral circulation depends upon the power of the heart, the condition of the vessel walls and anatomic anomalies. According to von Bonin there are also to be considered the age of the patient, the site of the aneurism, the state of the tissues there, and the treatment of the vein. Hott disputes the assertion that the extremity is more exposed to necrosis, the more centrally the ligature is placed. Ligature of the axillaris and femoralis communis is said to be without danger whereas ligature of the femoralis underneath the profunda or of the brachialis underneath the circumflexa humeri is hazardous. Ligature of

the poplitea is said to be almost always followed by gangrene. Hott is further of the opinion that collateral circulation is unfavorably influenced by hemorrhage and tissue infiltration.

In examining the collateral circulation Gebele makes use of the method of Coene (Henne) which comprises compression of the arteries section of the vessels and venous ligation of the peripheral vascular extremities. Should blood issue from the peripheral end then as according to Coene, sufficient collaterals are present. It is emphasized however that this is not certain if the blood then comes from the capillaries about the outer periphery of the extremity. When after sectioning the artery there is a negative result there remains only the use of the urine. According to von Frisch the indication of a enough reflex an essentially much more certain sign of the peripheral blood sufficiency than the arterial hemorrhage from the peripheral stump.

Collateral examination according to Korotkoff consists of compression of the artery above the aneurism and the determination of the blood-pressure according to the R. Rous method in which the blood pressure should contain at least 30 mm. quicksilver indicated by Dilger von Bonin and others to be unreliable.

Moskowitz who has introduced and recommended active hyperemia in the determination of the height of the arterial lower in gangrene of the foot uses collateral inflations in rubber bandage which he applies for 10 minutes below the aneurism. Then he presses the artery against the bone until all pulsation in the sac has ceased. If the collaterals are able to perform their duty then hyperemia should result upon release. Instead of the tubebandage Moskowitz says it is sufficient to raise the arm or leg and lower the body. Intense hyperemia in spite of compression of the main artery is in Moskowitz's opinion positive sign of sufficient collateral circulation. In all cases in which this trial of hyperemia results negatively if the condition of the patient does not require immediate operation Moskowitz repeats the compression treatment until the hyperemia trial becomes positive. In operation which cannot be postponed or when the carotid is involved he recommends the contraction of the nutrient artery and the introduction of the collateral circulation by free transplantation of fascial strips.

Owing to the impossibility of ascertaining the value of the collateral circulation without fail, the operating surgeon is forced to adopt suture wherever possible rather than ligature, in the treatment of gunshot aneurisms. A triumph of suturing is the reimplantation of shot-away extremities, which operation has been successful in a few cases. Thus Jeger shut up in the fortress of Przemyśl and unfortunately dying a Siberian prisoner cured with good functional result a gunshot wound of the upper arm, with injury of the basilic vein of the brachial artery and connected veins, with separation of the

median and ulnar nerves of the biceps muscle the brachialis internus and the triceps as well as a fracture of the humerus at the juncture of the upper to the middle third.

W. A. BRENNAN

Reid M. R. Partial Occlusion of the Aorta with the Metallic Band. Observations on Blood Pressures and Changes in the Arterial Walls. *J. Exp. Med.* 1916 xvi 28

In all except one of the aortic experiments of Halsted and the author the constricting aluminum band was applied to the abdominal aorta below its inferior mesenteric branch. At the time of their final observations on these animals records were made of the blood pressures in the femoral and carotid arteries. Obviously in order to draw any conclusions as to the effect of the band on the blood pressure below the site of the constriction the normal relation between the pressures in these two vessels must be known.

In a series of experiments performed by Dawson on dogs it was learned that the pulse pressure in the femoral artery is normally about twice as high as in the carotid. The femoral systolic pressure is higher and the diastolic pressure lower than the corresponding pressures in the carotid artery.

After partial occlusion of the aorta the systolic pressure in the femoral is markedly lowered. This lowering of the systolic pressure is due mainly to a fall in the pulse pressure for the diastolic pressure remains almost stationary or may be a trifle increased. In the cases of most marked dilatation the femoral pulse pressure was only about one half the carotid pulse pressure while the femoral diastolic was actually greater than the carotid diastolic pressure.

During the first hour after the application of a moderately tight band the femoral pressures undergo marked changes. At first the systolic and diastolic pressures are both lowered. In a few minutes the diastolic pressure may become even greater than before the application of the band while the systolic is still subnormal.

After complete occlusion of the aorta the normal blood pressure relation between the femoral and carotid arteries may ultimately in some instances be re-established.

In some cases in which the band has been loosely applied only slight gross alteration in the wall of the vessel under the band is found even after six months. On removal of the band the plications of the wall can be unfolded and the intima presents a smooth normal looking surface.

For a short distance below the site of the band there is usually a definite atrophy of the elastic and muscular tissues. The connective tissue throughout the wall of the artery seemed to be little affected in amount in the dilated portion of the vessel.

At the site of the band the new wall that forms over it is composed mainly of fibrous tissue. Thus far none of the author's cases has shown regeneration of the elastic tissue in this new wall, he states

In the fibrous cord which occasionally forms under the tightly rolled band no remains of the vessel wall have been found. It is thought probable that the original arterial wall undergoes complete atrophy and absorption in these cases and that the cylindrical cord found under the band consists of new tissue which growing in from above and below replaces the old. This cylindrical fibrous cord may be highly vascularized. The author has found no evidence of union between the apposed intimal surfaces.

GEORGE L. BENLAV

Halsted W. S. An Experimental Study of Circumscribed Dilatation of an Artery Immediately Distal to a Partially Occluding Band and Its Bearing on the Dilatation of the Subclavian Artery Observed in Certain Cases of Cervical Rib. *J. Exp. Med.* 1916 xlv 371

From a careful study of the original reports of 16 cases of cervical rib Halsted found that aneurism or dilatation of the subclavian artery was noted in 2 or more of them including 6 in which the surgeon believed that the vessel was abnormally large and 2 in which the aneurism appeared promptly after removal of the supernumerary rib. He believes that there may have been other instances of dilatation of the subclavian associated with cervical rib in which the amount of arterial expansion could not be determined in the lack of a standard of comparison.

This experimental study is based upon observations upon 30 dogs with aortic constriction. In these 30 dogs there was pronounced dilatation for a short distance of the vessels below the band in 7 or 23 per cent.

From Halsted's observations and experiments he believes that the intimal surfaces of arteries brought intact in apposition, whether by ligature or by band have never united. Thus, he states is at variance with the quite universally accepted view that uncrushed intimal surfaces if brought gently in contact adhere and thus occlude the artery. In the author's opinion the pressure necessary to bring about the complete closure of the aorta causes atrophy of the arterial wall under the band and union of the apposed surfaces thus deprived of their blood supply does not occur.

The process of occlusion he believes, is somewhat as follows. The death of the arterial wall having been brought about by the pressure of the band a gradual substitution or organization of the necrotic tissue takes place, the new blood vessels penetrating it from both ends. The absorption of the lifeless wall proceeds co-ordinately with its vascularization or organization. He gives the following summary of his study.

1. A partially occluded artery may dilate distal to the site of constriction.

2. The dilatation is circumscribed.

3. When the constriction has been either slight in amount or complete dilatation has not been observed.

4 The dilatation was greatest when the lumen of the artery (the aorta) was reduced to one-third or perhaps one fourth of its original size.

5 Dilatation or aneurism of the subclavian artery has been observed twenty-seven or more times in cases of cervical rib.

6 The dilatation of the subclavian is described as distal to the point of constriction and strikingly resembles the dilatation which has been produced experimentally.

The genesis of the experimental dilatation and the subclavian dilatation occurring with cervical rib is probably the same.

8 When the lumen of the aorta is considerably constricted the systolic pressure may be permanently lowered and the diastolic pressure so increased that the pulse pressure is greatly diminished.

9 The experimentally produced dilatations and the aneurisms of the subclavian artery cases of cervical rib are probably not due to vasomotor paralysis, trismus or sudden variations in blood pressure.

10 The abnormal whiplike pulsation of the blood in the relatively dead pocket just below the site of the constriction and the lowered pulse pressure may be the chief factors concerned in the production of the dilatations.

11 Intimal surfaces brought together gently in contact by bands of ligatures do not in the author's experience, unite by first intention for the force necessary to occlude the artery sufficient to cause necrosis of the arterial wall.

12 Bands rolled over so tightly do not rupture the intima.

13 The death of the arterial wall having been brought about by the pressure of the band a gradual substitution of the necrotic tissue takes place the new vessels penetrating it from both ends. The author believes it is in this manner that an artery becomes occluded and it is thus that a thrombus is formed within the constricting band.

C. K. L. F. B. (Lyon)

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Stewart G. N., and Rogoff J. M. The Spontaneous Liberation of Epinephrine from the Adrenals. *J. Pharmacol. & Exp. Therap.* 1916, vol. 479.

It has been stated by various writers that epinephrine is liberated from the adrenals under experimental conditions in the absence of artificial stimulation of the splanchnics and that the liberation is dependent upon the integrity of these nerves. This liberation may be conveniently designated as spontaneous, without implying that it is necessarily a physiological process and not excited merely by the abnormal sensory stimulation the anaesthesia and other factors connected with the experiment.

In the present condition of the question whether epinephrine is normally, or at least under experimental conditions, given off to the blood by the adrenals

in the absence of artificial splanchnic stimulation, it seemed desirable to the authors to try methods less open to objection especially so far as the determination of the amount of epinephrine liberated is concerned. As regards the further question whether the action of the splanchnics is discharged completely abolished or only diminished they do not see how it is possible to answer it by the aid of methods which permit the development of the pressor substances in the shed blood and depend upon associated reactions of the test objects.

The authors have endeavored to overcome this difficulty by using a method which does not require withdrawal of the blood to be tested, namely collection of a renal vein blood in a pocket of vena cava, which is then released. The presence of epinephrine in the blood is deduced from its action upon the denervated in situ succinate membrane and upon the blood pressure of the same animal. The identification of the change in the blood-pressure curve produced by epinephrine is greatly assisted by simultaneous observation of the eye reactions. The amount of epinephrine liberated can be estimated by imitating the effect on the blood pressure curve by the injection of appropriate amounts of adrenalin in salt solution.

Cats were employed in the great majority of the author's experiment. A few dogs were used for special points.

The spontaneous liberation of epinephrine has been studied (in the cat) by means of the (denervated) eye reactions and the blood pressure changes caused by blood from the adrenals when permitted to pass into the circulation from a pocket of the vena cava which it has been collected in known amount and for known periods of time.

As the blood is not withdrawn from the vena cava the uncertainty introduced by the rapid development in the blood of pressor bodies which imitate the action of epinephrine on some of the objects most generally used in biological tests for that substance is eliminated.

The simultaneous observation of the eye reactions greatly aids the interpretation of the blood-pressure curves when the amount of epinephrine is small.

The approximate assay (without withdrawal of blood) of the epinephrine in the blood collected in the vena cava pocket from the adrenals by the injection of varying doses of adrenalin generally presents no difficulty. It must be repeated from time to time in the course of an experiment when the condition of the animal changes. The amount of epinephrine spontaneously liberated in cats was found to vary in different experiments within a rather narrow range considering the differences in the conditions (from 0.0008 to 0.0038 mg. per minute per animal or from 0.0003 to 0.001 mg. per minute per kilo of animal).

After section of both sympathetic trunks in the thorax near the diaphragm, including the major splanchnics, the spontaneous liberation of epinephrine is completely abolished. Division of the major

splanchnics in the abdomen does not necessarily cause total cessation of the secretion in all cats. In one animal a detectable amount was still liberated, but the liberation was entirely stopped when all the fibers coming to the semilunar ganglion were cut.

The fall of blood pressure caused by section of both splanchnics has nothing to do with the failure of the adrenals to liberate epinephrin the authors state. For when the nerves of the right gland alone are divided and the left adrenal vein clipped the blood collected from the right adrenal in the cava pocket yields no epinephrin reactions on release of the pocket.

Although, as is known, cats survive indefinitely the removal of one adrenal and division of the nerve supply of the other, no detectable epinephrin was found in the blood coming from the remaining adrenal five weeks after the operation. Good reactions were obtained on massaging the gland.

No increase in the epinephrin liberation was detectable when sensory nerves (brachial) were stimulated. If any increase was produced by asphyxia in the authors' observations it was very slight.

GEORGE E. BEILBY

Marshall E. K. Jr. and Davis D. M. The Influence of the Adrenals on the Kidneys. *J Pharmacol & Exp Therap* 1916 viii 525

In the course of an investigation on the distribution of urea in body fluids and tissues the authors had occasion to analyze the tissues from two dogs which had died as the result of double adrenal extirpation. These showed about five times the normal content of urea. This rather suggested that after the removal of the adrenal glands from animals there exists either a condition of renal insufficiency or a greatly increased protein catabolism. The present investigation was undertaken to determine whether an accumulation of nitrogenous products in the blood and tissues was a constant condition after complete removal of the adrenal glands, whether increased protein catabolism or renal insufficiency or both were essential to explain these changes, and whether or not an interrelationship between the adrenals and kidneys existed.

In operating the adrenal was removed through a lumbar incision starting near the costal margin and running generally parallel to the fibers of the transversalis muscle. The lumbar vein was tied and cut on both sides of the gland, the gland loosened up by blunt dissection aided by a traction suture placed through it and finally snipped out close to the capsule, with scissors. The peritoneum was then closed over the adrenal site by a running or purse-string suture of fine silk. This procedure always arrested any slight oozing of blood and prevented adhesions. The right adrenal was always removed first. Closure was performed in two layers with obliteration of dead spaces. Aseptic precautions were observed and there were no infections. The animals were anesthetized with ether given

by the intratracheal method. From their investigation the authors draw the following summary.

1. Cats from which both adrenal glands have been completely removed by the interval method and precautions employed by Elliott have survived from one to seven days.

2. The urea concentration in the blood rises after complete removal of the adrenals to about twice the normal value and remains approximately stationary at this level until shortly before death when it again rises.

3. The phenolsulphonephthalein excretion shows a tendency to diminish after adrenalectomy.

4. Cats with both adrenals removed excrete much less urea and creatinine in the urine after an injection of these substances than normal or singly adrenalectomized animals.

5. The kidneys of adrenalectomized animals show no noticeable histological change from the normal but those of adrenalectomized animals which have received an injection of urea, creatinine and sodium chloride show a striking change from the control animals.

6. The nitrogen excretion in the urine of adrenalectomized cats is slightly diminished after the operation, the diminution being accounted for by the retention of nitrogen products in the organism. Hence there is no marked change in protein catabolism.

7. The above facts, which have been demonstrated by the authors, indicate a marked lowering of kidney efficiency in adrenalectomized cats. This may occur with a normal blood-pressure and when the animals are in excellent physical condition.

8. The bearing of these facts on the interrelationship of the adrenals and kidneys is discussed and the excretion of some substance by the adrenals which is necessary for the maintenance of normal kidney function serves as a probable explanation of the results obtained by the authors.

GEORGE E. BEILBY

Fleisher M. S. and Loeb L.: Further Investigations on the Hereditary Transmission of the Differences in Susceptibility to the Growth of Transplanted Tumors in Various Strains of Mice. *J Cancer Research* 1916 i 331

From experimental study the authors conclude that variation of environment does not alter the susceptibility to growth of transplanted tumors in various strains of mice. It is generally admitted that differences in susceptibility to the growth of a certain tumor in animals belonging to different species and varieties is based on constitutional differences in these animals. It has been shown that different strains and families of mice which structurally appear to be identical may differ markedly in their susceptibility to the growth of the same tumor. Some are inclined to attribute this difference not so much to hereditary differences as to external conditions such as diet. Where mice have been transferred from one locality to another

and thereafter show changes in the proportion of the growth of transplanted tumors it does not how necessarily that the locality change is the factor that is basic. On the other hand, it is probable that animals have been selected in whom the condition for tumor growth is more favorable. From any strain of mice it is possible to select those where this is probable. The authors' observations show conclusively that these differences are inherited and not directly due to external conditions since they found that animals kept under identical conditions may maintain differences through a series of generations.

Four strains derived from various locations in the world were observed. The number of tumors after an inoculation with the same tumor as well as the percentage of tumor growing after total removal remained constant in three strains. In the fourth strain an apparent exception to this rule was found. The explanation of this fact—that most of the members of this strain were killed off by disease early in the experiment and the surviving members which were descendants of an original strain demonstrated that one of the populations had been bred out in which the percentage of successful inoculations remained constant in successive generations. Growth of inoculated tumors in hybrids between European and American mice showed that the first generation in both kinds of hybrids was almost as favorable to the growth of inoculated tumors as the American mice while in the second generation a marked fall in the number of definitely growing tumors took place. In the third generation the fall was still more pronounced. However in the fourth and fifth generation a decided increase was noted. This fact is at variance with the experience of Tyzzer.

HARRIS G. SLOAN

Marine D. and Rogoff, J. M. The Absorption of Potassium Iodide by the Thyroid Gland in Vivo, Following Its Intravenous Injection in Constant Amounts. *J. Phys. Med. Biol. Ther.* 9: 6 Jul. 1939.

In a previous paper one of the authors in collaboration with Feitel has shown that artificially perfused and surviving thyroids of dogs take up KI very rapidly and retain it in large amounts that this activity is not shared by other tissues of the body that KCN inhibits this activity and that only surviving thyroid cells manifest this phenomenon. At that time two experiments were reported in which 50 mg. KI were injected intravenously after the removal of a control lobe of the thyroid. The lobes exposed to the KI for one hour showed practically the same affinity for this salt as was found in the *in vitro* perfusions.

In the present communication the authors record the results obtained from a series of 33 experiments in which the KI was introduced intravenously. The plan of these experiments was as follows. In all but four experiments, dogs with grossly enlarged thyroids were used. After ligating the renal vessels

of both kidneys and removing one lobe of the thyroid as a control 50 mg. KI in 1 ccm. distilled water was injected into the internal jugular vein or one of its branches, below the thyroid area. Ether for anesthesia was the only drug used and in each case the usual aseptic technique was followed. The animals were all used to live for periods of 5 minutes, 10 minutes, 1 hour, 4 hours, 8 hours, 12 hours, 16 hours, 20 hours, 4 days and 3 hours following the injection of KI. In four experiments—two of 5 minutes duration and two of 10 minutes duration—the anal vessels were not ligated. Then the exposed lobes were removed, weighed and immediately fixed for histology and the remainder of the thyroid together with pieces of liver and spleen desiccated for iodine determinations. The thyroid lobes used varied markedly in size in iodine content and physiologic activity as indicated by the range of histological appearances from quiescent or colloid to marked active hyperplasia.

As shown in the next perfusion the amount of KI absorbed necessarily varies with the surface exposed (size of gland) and the stage of physiological activity—blood or normal glands showing the least increase in iodine. Any analysis of the quantities of iodine absorbed from a given dose must take into consideration both the size and the stage of physiological activity of the glands used.

There is apparently no difference in the authors' state, between *in vivo* and *in vitro* perfusions as regards the percentage of iodine absorbed. The absorption is practically instantaneous in each case. Maximum thyroid effect are produced by such exceedingly small amounts of iodine and the gland has such an extraordinary affinity for salts of iodine that its loss through the kidney may be considered negligible and this probably holds true for all other body tissues. The size of the gland and the stage of physiological activity modify the amount of KI absorbed apparently to the same degree whether it is introduced by a *in vivo* perfusion or injected intravenously in the living animal.

The liver and spleen show no retention of KI whether introduced by a *in vivo* perfusion or by intravenous injection. With constant amounts of KI introduced and with glands of similar degrees of physiological activity there is no noteworthy difference in the percentage absorbed, whether the *in vivo* perfusion last 1 hour or 3 hours. There is a slight increase in the amount of iodine absorbed from a single dose in the succeeding minutes following a given experiment but it was not sufficient to be detected as an increase in the iodine content of the thyroid in this series of glands with the methods employed although after one hour it was not present in detectable amounts in the blood.

C. G. L. BRIDGES

Goodman, C. Th. Transplantation of the Thyroid Gland in Dogs. *Am. J. Anat.* 30: 40, 1938.

The author briefly reviews the subject of transplantation of tissue and organs as autografts or

homoplasts, and reports 30 cases of transplantation of the thyroid gland with the segment of the carotid artery 3 of these cases being autoplasts and the remaining 27 homoplasts. In three instances in the latter group the parathyroid gland remained in a normal state of preservation while the thyroid gland showed evidences of autolysis. In the former group of three cases they succeeded in retaining the thyroid gland in its normal state microscopically in 2 cases.

Regarding the transplanted blood vessels. The carotid artery remained free from thrombosis in 25 cases the thyroid gland in 4 cases although the gland transplanted had undergone autolysis and was partly absorbed. The author believes that autotransplantation is practicable however and concludes that at the present time there are no means of prolonging indefinitely the life of an organ transplanted from one animal to another.

HENRY J VAN DEN BERG

Holman W. L. The Classification of Streptococci. *J Med Research* 1916 xxxiv 377

During the last few years the author has had the opportunity of studying large numbers of streptococci from a great variety of sources. These included strains from general surgical material blood and throat cultures materials from the obstetrical gynecologist otolaryngologist ophthalmologist and others, strains isolated at autopsies from man and animals, and a variety from milk and other sources. During this time his chief endeavor has been to discover the best method for isolation of these organisms, and the media most favorable for their growth. In many cases great difficulty was encountered in obtaining pure cultures where other organisms were present in the material. In other cases it was sometimes a problem to obtain satisfactory growth, even when the organisms were isolated. From his extensive and careful study the author draws the following conclusions:

1. A simplified and practical method to classify streptococci is desirable and the combination of Gordon's carbohydrate fermentation and Schott muller's blood agar tests modified for practical purposes offers the most useful means to this end.

2. Constancy of these reactions is essential to the method here advocated. Evidence of transmutation or examples of inherent alteration of character have been insufficient to invalidate this method. The confusion in the results of these tests and most of the examples of so-called alterations are explainable by the relative difficulty of growth and the morphological similarity among the different types. Mixed cultures are difficult to detect and often hard to separate and the strains vary widely in their longevity and resisting power. Alterations in vigor of growth must be guarded by using the most favorable media and extending the time of observation. Animal experiments are unreliable owing to the high invasive power of streptococci of the animal itself.

3. Standard methods should be followed. The carbohydrate serum broth described by the author and five per cent defibrinated human blood agar offer the best media for this purpose. Quantitative carbohydrate acid tests by titration are not as useful as the qualitative tests. They add considerable unnecessary labor without any corresponding advantage. Andrade's decolorized acid fuchsin is an eminently satisfactory indicator for qualitative tests.

4. The classifying of streptococci by the method here outlined can be carried out in the routine bacteriology of any laboratory. It is unnecessary to make it a special research problem.

5. The author's method for carrying out the classification is briefly as follows. All material is cultured in serum broth before plating on blood agar. The cultures are tested on blood agar slants for hemolysis, and in lactose mannitol salicin, and inulin serum broth for fermentative power over a period of at least seven days.

6. By this method of classification is recognized the hemolytic and non-hemolytic group, under each of which eight subgroups are arranged.

7. Much information of practical importance concerning streptococci is made available by the use of this method of classification. Many of the air streptococci can be traced to their sources and the same is true of streptococci found in milk, the mouth, the intestinal tract, animal tissues and other places.

8. The individual groups of streptococci are not specific in their disease production. The members of the hemolytic group are commonly more virulent and pathogenic producing progressive disease processes more rapidly than those of the viridans group.

9. Almost all streptococci have relatively high invasive powers, and the varying conditions of lowered resistance play a most important rôle in determining the type of infection. This is especially true in the chronic infections.

10. Focal areas of streptococcus infection often contain more than one type of streptococcus. The apparent alteration of character of the streptococci in these cases is due to the confusion arising from the mixtures. In the mouth, intestinal tract, the vagina, and in other regions the entire flora including the streptococci may rapidly change with the alteration of the local environment.

11. It is believed that with the adoption of this classification greater uniformity will be established for the comparative analysis in the study of streptococci.

GEORGE E. BEULAY

Housney B. A.: Experimental Researches Concerning the Hypophysis of the Frog (*Investigaciones experimentales acerca de la hipófisis de la rana*). *Prensa Méd. Argent.* 1916 III 8.

The author has made a number of experiments on the common Argentine frog *Leptodactylus ocellatus*. Previous experimental work along the same lines

(6) The vessels are dilated and congested, are hyaline and contain thrombi of the same nature. If these be contrasted with the cord lesions in lymphogenous infection the difference is at once obvious. Lymphogenous infection is characterized by (1) the reaction of the cells of the fixed connective tissue, (2) the proliferation of the cells of the adventitial sheath of the veins and capillaries, (3) the appearance of numerous scavenger cells when the myelin is disintegrated, (4) nerve-cell degeneration and neuronophagy. From the above, the authors conclude that the lesions in hematogenous intoxication differ very widely from those found in lymphogenous infection where the fixed tissues are actively proliferating and all the morbid phenomena are of an inflammatory type. The difference between the two might therefore they state, be expressed by saying that in lymphogenous infection the inflammatory phenomena reach their maximum in hematogenous intoxication they are reduced to a minimum and they consider this a most important distinction in neuropathology.

From the above clinical and experimental study it is clear that the two mechanisms of infection of the cerebrospinal system—the hematogenous and lymphogenous—are characterized by sufficiently distinct morbid phenomena and if the results of the experiments are applied to the human subject very considerable assistance is obtained in arriving at an understanding of the genesis of certain lesions.

The authors have brought forward ample evidence to show that acute and chronic myelitic conditions are readily produced by infection of the ascending lymph system in nerves. They have previously expressed the opinion that general paralysis of the insane is a chronic inflammatory disease of lymphogenous origin. This opinion is based on the close similarity between the vascular lesions in this condition and those found in their experiments where the lymph system of the nerves or cord was infected. The striking predominance of adventitial proliferation and infiltration can be explained only by toxic infection of the cerebrospinal lymph. There is no evidence of a general blood intoxication, they state for in dementia paralytica, as in their experiments, the endothelium of the vessels may be quite unaffected, while the adventitial spaces are packed with the products of proliferation. Further to substantiate they assign the same lymphogenous genesis. The vascular phenomena similar to those in general paralysis, the constant primary affection of the root entry zones and the rigidly systemic character of the lesion in the opinion of the authors preclude any other conclusion.

GEORGE E. BRILL

Paa, D. de la, and Garcia F.: An Experimental Study of the Use of Apomorphine to Remove Foreign Bodies from the Respiratory Passages. *Philippine J. S.* 96: 155

This experimental study was carried out with the purpose of determining whether or not the use of apomorphine to remove foreign bodies from the

respiratory passages is a justifiable procedure. The authors mention the claim that has been made that coincidentally with the act of vomiting caused by apomorphine, violent movements of expiration are produced which expel or at least facilitate the expulsion of the foreign body from the respiratory passages. Dogs were made use of in these experiments because of the ready response of the vomiting center in these animals to the intramuscular injection of apomorphine.

Under light ether anesthesia the tracheal cannula was inserted into the trachea through a short incision in the anterior median line of the neck. The animal was allowed to recover from the influence of the anesthesia, and about two hours later different degrees of obstruction to the passage of air into the trachea were produced by placing a tight clamp on the rubber tubing connected with the free end of the tracheal cannula and by connecting the rubber tube with short pieces of glass tubing whose diameters at one end had been flamed to about 0.9 and 1.5 millimeters respectively. Apomorphine hydrochloride (0.1 ccm. of a 5 per cent solution per kilogram of body weight) was injected intramuscularly at varying intervals from the commencement of respiratory obstruction.

The result of their experiment, the authors state, point conclusively to the impossibility of removing foreign bodies from the trachea by the use of apomorphine. It seems moreover that a foreign body in the respiratory passages below the larynx may in reality be driven farther in during the early stage of vomiting because of the descent of the diaphragm and closure of the glottis which in turn give rise to the rarefaction of the air in the thoracic cavity and a rushing of the air into the deeper portion of the lungs. When tenacious mucous plugs are present in the bronchioles this may be more than counterbalanced by the stimulating effect of apomorphine on the secretory and peristaltic of the bronchioles which may loosen and facilitate the expectoration of the plugs after vomiting.

From this study the authors draw the following conclusions:

Transient stimulation followed by paralysis of the vomiting center occurs when non-anesthetized dogs are apomorphinized by shutting off the air from the trachea.

Partial asphyxia such as is produced by reducing the lumen of the trachea to a circular opening of about 1.5 millimeters in diameter, shortens the time required for the emetic action of apomorphine. This is due, presumably to the increased irritability of the vomiting center to apomorphine.

The intrapulmonic pressure is raised by the convulsive contraction of the abdominal wall which occurs during vomiting and the rise of pressure seems to begin before the passage of vomitus through the esophagus.

The glottis remains closed during the act of vomiting as shown by the method described by the authors. This conclusion is further confirmed by

the observation that no expiration occurs during the act of vomiting

5 A strong expiratory effort is not produced immediately after the expulsion of the vomitus.

6 The administration of apomorphine cannot facilitate the removal of foreign bodies from the trachea.

GEORGE F. BRILEY

Jackson D. E.: The Peripheral Action of Opium Alkaloids with Special Reference to the Bladder
J Lab & Clin Med 1916 1 862

The experiments described in this paper prove that those opium alkaloids which belong to the phenanthrene series, i.e. morphine, codeine, thebaine, heroin, diionine, peronine, etc. in large intravenous doses cause in dogs a profound contraction of the bladder. The author has previously shown that a similar contraction of the bronchioles is produced by these drugs. Probably a few of the isoquinoline opium alkaloids, including narcotine, may also cause a similar action, he states. He has failed in a few experiments to obtain this contraction with some other of these alkaloids, notably papaverine, cryptopine, and cotarnine.

Apparently the contractions of the bladder and of the bronchioles produced by these drugs are strictly analogous and in all probability of identical origin. The contractions in both organs occur simultaneously, are usually of approximately the same proportions, last for corresponding periods of time, and when the initial contraction is maximal, then later injections of any sized doses of either the initial drug or of any other of the series will not produce any further contraction whatever of either bladder or bronchioles.

If the initial contraction was not maximal, then much larger doses of the initial drug or of another of the (phenanthrene) series may the author states cause a second contraction, but even by proceeding by degrees in this manner a third contraction is almost never obtained. When the bladder and bronchioles have thus lost their susceptibility to the action of these opium derivatives, they are still found to possess practically normal sensitivity to all drugs which usually act on them, including lobeline, nicotine, pilocarpine, arecoline, muscarine, atropine, barium, vanadium, adrenalin, etc. Previous destruction of the brain and spinal cord by the injection of lobeline or atropine or both does not prevent or probably even specifically decrease the extent of the reaction to heroin, codeine, morphine, etc. The author thinks that possibly curare in very large doses may weaken the response of the bladder and bronchioles to these opium bodies.

These reactions closely resemble those produced by drugs which first stimulate and secondarily paralyze nervous structures, such for example, as the action of lobeline on ganglia. But so far as the author has been able to determine by pharmacological means, no paralysis of either nervous or muscular structures is produced by these alkaloids. Ordinarily this action of the opium bodies would be

attributed to a direct action on the muscle fibers since it occurs after atropine (and curare). But since a bladder which has become completely immune to further injections of these opium bodies may give so far as he has been able to determine a perfectly normal response, i.e. a profound contraction to ordinary doses of barium, vanadium, pilocarpine, muscarine, or even lobeline, he has been unable to see why the loss of response to the opium alkaloids should be attributed to muscular rather than to nervous origin.

GEORGE F. BRILEY

RADIOLOGY

Ledoux Lebard R. The Radiologic Diagnosis of Gaseous Gangrene (Le diagnostic radiologique de la gangrene gazeuse) *J de radiol et d'elect* 1916 11, 41

The presence of even a small quantity of gas in tissues other than the lung which are normally deprived of it is shown on the photographic plate by a characteristic image. But although such instances have been carefully studied by radiologists, the knowledge has not been classified so as to form a source of valuable information to the surgeon.

The author has had occasion to observe a case of gas gangrene which has spread so rapidly as to necessitate an amputation of the thigh. On radiographing the stump the plate revealed considerable gaseous infiltrations in points where it was not clinically manifested. The author thinks that in cases of gaseous gangrene which appear to call for amputation, radiography should be used as often as possible and that the demonstration in this way of infiltration along a muscle where there is no other indication of its presence would call for higher amputation than would otherwise be indicated. The results obtained would then perhaps be better.

W. A. BRENNAN

Shohan J. Some Theoretical Considerations on the Present Status of Roentgen Therapy
Boston M & S J 1916 clxiv 321

Considering the insurmountable difficulties and the contradictory effects of the roentgen rays in its various fields, it is small wonder that greater advance has not been made. The author points to the analgesic effect of these rays, and the pain caused by a burn from them. On the other hand, while it will cure some forms of cancer, it will also cause cancer. Attention is drawn to the various stages in the advance in this field, but more especially advances due to the various observations of different authors upon the physiologic effects upon the tissues. Reference is made to Heineke's researches upon the blood, at first there is a rise in the number of white cells followed by a drop, the polynuclear leucocytes suffer most, then the lymphocytes. As to the cause of these changes, he quotes Wickham. Every ray that strikes a cell, no matter what the source of the ray, exerts some influence on that cell. This reaction is the result of

many and various factors. The most important ones are (1) the degree of the receptivity of the cell in other words is specific radio-sensibility (2) the quantity of ray absorbed in a unit of time (3) the specific peculiarity of the kind of rays (4) the time elapsing between the radiation and the histologic examination (5) the filtration of the rays through the tissues.

As to the sensibility of the tissues he quotes Wetterer. Normal tissues—lymphoid tissue, testicles and ovaries, facial skin of a child, hild cartilage, mucous membrane of the pillar, hild body skin, interior of blood vessels. Skin of the face of the adult, sweat gland, sebaceous glands, skin on the body and head of the adult, liver and kidney, parenchyma, blood-vessels, connective tissue, muscles, cartilage of adult bone (all in the order named). Pathologic tissue—leukemia and parvotoluemia, tissues recent patches of psoriasis, acute eczema, chronic eczema, mycosis fungoides, lymphosarcoma, acne vulgaris, old patches of psoriasis, round cell sarcoma, hypertrophic prostatic hypertrophic lupus, tuberculous lymphoma, osteioma, mycotic heart, bone tuberculous, parenchymatous gonorrhea, lupus plantaris, dry form warts, lupus verrucosus, fibroma, myoma. The various diseases treated by the roentgen rays are considered both from the author's personal experience and from the experience of various foreign authors, and he concludes that if the biochemical theory is accepted there is a promise of better days for the malignant cases.

W. S. NEWCOMB

Hammond R. Some Causes of Error in the Roentgen Diagnosis of Bone and Joint Conditions. *Am J Roentgenol* 9:6 12, 385.

In order that the roentgenologist may avoid errors in reading X-ray plates of the bones and joints he must possess adequate knowledge of the laws of physics governing the roentgen rays as well as a thorough familiarity with the normal roentgen anatomy and its many variations due to age and individuality. A lack of standardization is one of the most common causes of error in this work. The operator must make plates according to a standard which he has worked out for himself or he must know the technique used in making a given plate before he can read such plates accurately. The author calls attention to a number of errors commonly encountered.

ROBERT B. CORLISS

Singer J. J. The Interpretation of Roentgenograms of the Chest in Tuberculosis. *J M St M Ass* 9:6 411, 300.

Singer briefly states the views of various roentgenologists as to the physical basis of the branched shadows seen in lung plates. He believes the hilus shadow is caused by primary branches of pulmonary blood vessels plus the walls of primary branches of bronchi together with lymphatic glands and the fibrous tissue which accretes to these structures.

A brief statement is given of the relations of the physical signs to the roentgen findings based on a study of 100 cases. He finds that the plate indicates much more pathologic changes than do the physical signs because a slight increase in pulmonary tissue will show roentgenologically before it is marked enough to be evident by auscultation.

The conclusions arrived at are as follows:

1. A roentgenogram represents one of the most accurate aids in diagnosing lung conditions.

2. When an area of lung tissue normally distended with air is not distended with air on inspiration some pathologic condition is present—probably tuberculosis.

3. When the lung is distended with air both in inspiration and expiration, we have an area of emphysema.

4. The denser the interlobular markings the more infiltration.

5. Cavities whether filled with pus or broken down tissues, can readily be determined by the surrounding definite shadow and the absence of the interlobular markings within.

6. In earliest demonstrable tuberculous conditions we see delicate interlobular lines approximated and apparently held so by delicate adhesions—a provocation of Nature limiting the affected area to produce rest and cure—the muscle spasm over this area is analogous to abdominal inflammation with its attendant muscle spasm.

7. When tuberculous patients are forced to breathe deeply by exercise, high altitudes, or a rapid pulse from any other condition, air is forced into these apparently closed lobules, tearing up delicate adhesions from this separation of the alveoli, fever results with possible hemorrhage and increase of severity of the toxemia.

8. All plates of adults show some pathologic process which coincides well with the fact that nearly all adults react to tuberculin. DAVID C. STRAIN.

Hartung A. Congenital Anomalies and Variations of the Bony Skeleton as Revealed by the X-Ray. *Am J Roentgenol* 9:6 12, 430.

Before it is possible to interpret a pathologic condition one must have fairly good conception of the normal bone with the numerous variations and anomalies. These changes have been considered under three heads: (1) those which would be classified mainly as freaks of development where the information obtainable by roentgen examination is of scientific rather than practical value; (2) those in which the gross appearance shows the deformity and in which the roentgen ray is merely used to give accurate information as to the bony elements involved for the correction or modification; (3) the most important that large group of cases in which the roentgenogram gives conclusive evidence of anomalies, which may or may not have been suggested by symptoms, or which cause no symptoms, but offer obstacles to differential diagnosis when accidentally discovered.

Many illustrations of these classes are given and several important facts are brought forward us for instance where there has been an injury of some pathologic process to develop the cause that one of these irregular conditions may exist at the same time and be thought to be the cause of the supposed malady. In the lumbar region irregular development of the lateral processes of the spine or some irregular development of the last rib may give rise to error in being mistaken for a kidney stone. When studying sinuses of the head care must be taken to consider the normal irregularity of these cells and furthermore the thickened bone on one side may be perfectly normal and be regarded as a new growth or an inflammatory condition of the lining membrane. The irregularity of the teeth is a well known fact and they should be carefully studied before any radical measure is undertaken. In correcting deformities the roentgenogram should be carefully made and studied so as to obtain the best possible knowledge of the existing conditions. Attention is also called to the fact that in the development of the child the parts on the opposite side of the body usually develop at the same rate and give about the same picture this is at times modified and should always be borne in mind.

Brausch W F and Mann F G Effects of Retention in the Kidney of Media Employed in Pyelography. *Am J U Sc* 1916 clii 336

The introduction of opaque media into the kidneys in pyelography is sometimes followed by dangerous symptoms or even death. The authors have reported several cases of hydronephrosis where the kidneys were removed following pyelography numerous foci of necrosis in the cortex being found.

In order to determine whether this condition was due to the retention of chemical irritants or to bacterial infection a series of experiments was performed upon dogs. The technique used necessitated the ligation of the ureter following the injection of the solution. As a consequence hydronephrosis followed and the results of this condition had to be differentiated from the action of the solution itself.

Solutions of sodium chloride boric acid sodium citrate methylene blue various colloidal silver compounds, thorium nitrate and washed staphylococci were used. The changes due to the injected solution itself varied but in general they consisted of areas of focal necrosis located usually in the cortex occasionally in the medulla which appeared to be an accumulation of the substance injected. In some cases infection was superimposed upon this accumulation. Observations made tend to show that the material reached these locations both directly through the tubules and indirectly by absorption into the blood and lymphatics and excretion by the kidneys.

The conclusions arrived at as a result of the experiments follow.

1 The great danger in silver preparations is their retention in actively secreting kidneys.

2 Where multiple areas of necrosis occur the kidneys should be removed.

3 Necrosis the result of infection may follow the introduction of a ureteral catheter or of bland fluids into a pelvis with insufficient drainage.

4 Argyrol collargol and carentos produced the most marked changes. The metal itself was often found in the necrotic areas. Weak solutions were apparently as harmful as concentrated ones.

5 Silver iodide preparations were less harmful than colloidal silver preparations. The best preparation of silver iodide was the suspension in quince seed emulsion.

6 Ten and fifteen per cent solutions of thorium nitrate thoroughly neutralized were the least harmful of the opaque preparations used, but the shadows were less distinct than with silver preparations.

7 Mild chemical irritants such as sodium chloride or boric acid, did not produce lesions.

8 Stronger chemical irritants such as sodium citrate and 20 per cent thorium nitrate produced lesions apparently due directly to the chemical used and not to infection.

9 Methylene blue produced no lesions.

G W GRIER

MILITARY SURGERY

Fraser J and Bates H J Further Observations on the Treatment of Gas Gangrene by the Intravenous Injection of Hypochlorous Acid. *Brit J J* 1916 li, 172

The authors report 7 cases of gas gangrene treated by intravenous injections of hypochlorous acid. In 4 of these there was improvement and ultimate recovery. Of the 3 remaining cases which died one case was afterward found not to have been gas gangrene and another had shown definite improvement but died after amputation of the thigh. It is therefore concluded that in only one case was there an inexplicable failure.

This method of treatment is directed against the toxemia of the gas bacillus with the idea that if the effects of the toxins are neutralized the patient will then be in better condition to throw off the infection.

W A. CLARK

Roberts, J E. H., and Statham R S S: The Salt Pack Treatment of Infected Gunshot Wounds. *Brit J J* 1916 li 282

The authors are enthusiastic over the results of the salt pack treatment in infected gunshot wounds. They have attempted to more or less standardize the treatment of these wounds but the treatment necessarily varies with the site, the nature and the degree of infection of the wound. In a general way it may be said that the wounds are widely opened up, foreign bodies removed, necrotic tissue lining the track excised, bleeding points tied with catgut and the salt pack applied. A piece of plain

gauze four to six layers thick is lightly wrung out of 5 per cent salt solution and laid in the wound care being taken to see that it covers the whole surface of the wound.

It is important that every accessible pocket be filled with the gauze. A few 40-grain tablets of salt are placed in the deepest part of the wound. A strip of gauze is then carried alternately from one end of the wound to the other and numerous tablets of salt laid between the successive layers. When the pack becomes flush with the skin surface a few more layers of gauze are applied and over this a thick wool dressing composed of at least three layers completely encircling the limb the whole being then firmly bandaged. The authors state they have frequently packed onto exposed main arteries and have never found a case in which the vessel has given way.

During the first twenty to twenty-four hours a copious exudation of serum occurs, but after this no further exudation takes place. As soon as the outer layers of the dressing become moist they are changed without removing the bandage. It is very important that the wound be kept at rest.

The pulse-rate and general condition of the patient are much better indicators of the well being of the wound than the temperature.

After a few days the outer dressings may acquire a very offensive odor. This is due to decomposition in the dressings themselves.

The authors state that it is sometimes difficult to change the outer dressings without disturbing the deep pack and they are now using deodorants. They speak very highly of Dakin's chloramine T powder.

The indications for changing the pack are

1. A continuously rising pulse-rate
2. Increasing edema in the limb
3. Sudden onset of severe pain. This generally means spreading gas infection.
4. A persistent rise of temperature for which no other cause can be found.
5. A change for the worse in the patient's general condition in cases in which a raised temperature has persisted from the beginning.
6. Coaling of pus from under the edge of the dressing. This is generally due either to the dressing having been left unchanged too long or having been too loosely applied.
7. The dressing must be reapplied when the pack has become loose from diminution in the circumference of the limb as edema disappears.

Where the innermost layer of gauze is found to be firmly adherent to the wound surface it is not removed but a new pack is applied within it.

When the wound is granulating healthily it is not advisable to continue the salt pack, and where a wound is not doing well with a salt pack, and a pure streptococcal infection is present, the use of a 1 per cent salt solution as a wet dressing, continuous irrigation or bath will sometimes be found to effect an improvement.

D. C. B. BROWN.

William, R. J. The Local Treatment of Burns on a Naval Hospital Ship. *Brit. M. J.* 1916, 11, 3, 8.

In this series 28 cases were treated, 15 of which were aseptic. The remaining 13 were septic to a greater or less degree and of this number 5 died.

The first dressing is of picric acid, and is left in situ for two days if no evidence of infection presents itself in the meantime. A characteristic odor is one of the first signs of infection.

Following the removal of the first dressing a mixture of equal parts of boracic acid ointment and vaseline is applied providing the burn is still aseptic. Both acid fermentations are used in the presence of infection. A special dressing is recommended in burns of the extremity which allows of easy removal by merely loosening a few tapes.

The importance of aseptic treatment of burns cannot be exaggerated. The surgeon should wear sterile gloves and recognize the earliest sign of infection in order to combat it actively.

J. H. S. LE

HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

Liability for Wrong Diagnosis. *Med. R.* 1916, 1, 109.

A suit was taken against a doctor for malpractice the claim being that of wrong diagnosis. The plaintiff's injury, as treated by the defendant, was a strain when in fact both the tibia and fibula were fractured. There was considerable testimony, not altogether in harmony, in regard to the difficulty of diagnosing injuries to the lower leg and also as to methods of examination, but all agreed that there were certain recognized tests or examinations to be made when the diagnosis was difficult, such as an X-ray picture and manipulation or moving of the injured part either with an anesthetic or without the latter being the least efficient because of the limited manipulation that can be done on account of the pain caused to the patient.

The defendant in this case did not etherize the patient nor have an X-ray picture taken, relying solely upon the manipulation of the injured parts and examination for deformity. His diagnosis was wrong but the mere fact that the diagnosis was wrong would be insufficient to render a physician liable for malpractice. In addition to the above facts being shown the plaintiff must show that such mistake was the result of negligence or carelessness on the part of the doctor and that he failed to exercise his best judgment and skill in diagnosing the plaintiff's injuries.

J. A. CASTAGNOLA.

Injury to Neck—Comparison of X-Ray Pictures. *Med. R.* 1916, 1, 122, 123.

The above case was brought by a railroad clerk for injuries sustained to his spinal column by sliding door belonging to the defendant. The reviewing court held that the refusal of the trial court

to allow Doctor Gray a roentgen ray expert to exhibit to the jury an X ray taken by him showing a man's neck in normal condition was an error. The plaintiff had introduced into the testimony two plates taken by a Doctor Brady a physician of limited experience in the use of the roentgen ray. These plates would have been meaningless to the jury in the absence of an explanation and interpretation by Doctor Brady which disclosed a fracture of the transverse process of the third cervical vertebra. If Doctor Brady's explanation of these pictures had been taken as correct it would have settled the controverted question of whether certain bones in the plaintiff's neck were broken. The plaintiff's attending physician however did not suspect a fracture until the pictures taken by Doctor Brady were explained to him. Doctor Gray the eminent roentgen-ray expert of large experience above mentioned testified that the pictures introduced by said Doctor Brady did not support Doctor Brady's contentions and said that he could demonstrate that fact from the pictures themselves by showing to the jury a picture of a man's neck in a normal condition. The plaintiff objected to the introduction of this picture. The Court excluded it saying that to permit comparison of the plaintiff's neck with other necks would lead to confusion. The reviewing court stated that it deemed it proper to allow the introduction of the pictures offered by Doctor Gray their value as evidence in contradiction of the explanation by Doctor Brady of the roentgen

ray of plaintiff's neck depending upon the correctness of a presumption that every man's neck is normal until the contrary appears and that the general form of structure of the neck is the same. The plaintiff was allowed to introduce a skeleton to show by way of comparison all the bones involved when in normal condition. The trial court deemed it proper to allow the plaintiff to show a neck in normal condition but refused to allow the same privilege to the defendant. The plaintiff was allowed to introduce testimony to show by means of the roentgen ray and the skeleton proof of his injuries and the reviewing court held that the same opportunities should have been given to the defendant to test the correctness of the explanation given by Doctor Brady. J. A. CASTAGNINO

Employment by Corporation *Med Rec* 1916
LXXIV 1091

In 111 N. E. Page 16 the Court discusses an appeal of a case in which a physician called by the manager of a corporation to treat an injured employee sued the corporation for his fee for services rendered. The testimony disclosed that there were no objections interposed by any of the directors of the defendant corporation to the employment of the physician. The Court held that there was a ratification by the company of the manager's original contract with the physician and that the corporation was liable for the doctor bill for services rendered. J. A. CASTAGNINO

GYNECOLOGY

UTERUS

Stone W S. Precancerous Changes in the Uterus. S & G. Oct 9 6 rev 48

Based upon the fact that the diagnosis of an er of the uterus can not be made either clinically or histologically until a definite destructive aparty is recognized Stone attempts to express the evolutionary character of the disease by the application of the term precancerous to those changes which show a variable quantity and quality of the other histological criteria of cancer

In a study of the literature and some uterine material which he has been able to collect numerous morphological alterations of epithelial growth have been found which differ but little from the regenerative activity of benign lesions, but which after longer or shorter time show features that are differentiated with difficulty from the alterations which are known to typify malignant neoplasms. The strongest support for this assumption is found in the reproduction of types which are seen in the different stages of their progress. The atypical features of a healing erosion are found to be determined by the original type of the primary erosion — simple, papillary follicular and the atypical types are again reproduced in the different types of fully established uterine cancer

In the author's cases, there were atypical healing erosions which are prototypes of either an epidermoid cancer or a papillary adenocarcinoma. There were leucoplasias which are prototypes of adult acanthoma. There were glandular hyperplasias which lead to adenoma or adenocarcinoma. Finally there were focal areas of leucoplasia combined with adenomatous hyperplasia which may furnish an origin for tumors designated as adeno-acanthoma. In short for each type of fully developed carcinoma there is a corresponding type of benign and intermediary change.

The need of close co-operation between the clinician and pathologist is emphasized in order to confirm or deny the histogenetic relations of the sequence of benign lesions and cancer. It is no argument, for the present, against the assumption of intermediary stages because no tumor process presents or follows in a given case. The evidence in the literature is already sufficient to show that a fully established cancer may exist without giving gross evidence of its presence, and numerous cases are recorded in which the curette has completely removed the disease. Neither is there reason to assume that precancerous changes without treatment always develop into malignant growths. Different types of fully estab-

lished tumors grow and destroy rapidly or slowly and it does not seem reasonable to assume that a developing cancer has the same momentum that a fully established tumor possesses. From a practical standpoint the author believes that the proper therapeutic procedure in these cases should be determined by a competent clinician

Ransohoff J and Ransohoff J L. Radiant Treatment of Uterine Cancer. I. S & G Phila. 9 6 rev 298

The paper is based upon a review of the literature and a report of 25 cases of cancer of the uterus treated by radium. Of the 25 cases in the authors' series are still well. Of these 3 have been well for two years, 6 from one to two years, and 2 from six months to one year. Of the 5 clinical recoveries there were 3 operable and 2 inoperable cases. Of the 3 operable cases one is well after two years and over one year.

The authors state that in their experience there has not been a single case of uterine cancer that has not been more or less benefited by radiation. Invariably there was cessation of the bleeding and foul discharges and pain was greatly or entirely relieved.

Their conclusions are summed up as follows:

1. Radium is the method of choice in the treatment of inoperable and borderline cases.
2. Of the three operable cases treated with radium a clinical cure has been effected in each case.
3. Cases clinically cured by radium should not be subjected to hysterectomy as the operation is difficult and dangerous. Max 8 Mar 1916

Boldt H J. High Heat Versus Low Heat in the Treatment of Cancer of the Uterus. S & G. Grace & Co. 9 6 rev 288

Boldt expressed himself fully on the relative value of high degrees of heat compared with low degrees of heat as a palliative therapeutic agent in the advanced stages of cancer of the uterus, in an article published in January, 1916, and judging from the comment on that he has received from physicians who have had experience with the treatment he believes his position was amply justified. His hypothesis was also corroborated by another autopsy in addition to the one that he had, by Dr. F. W. Ranerott of New York.

He does not wish to be understood as detracting from the usefulness of low heat but believes that it should be reserved principally for a second application after rapid destruction has been accomplished with high heat and the charred eschar that as

caused by the high heat has been thrown off and for those cases in which the cancer has so far advanced that the proper application of high heat would endanger the bladder or rectum.

He contends that the danger from secondary hemorrhage is not less with low heat than with high heat, and that no evidence has been presented showing the superiority of one method over the other.

He states that heat properly used and applied in correctly selected cases sometimes gives remarkably good palliative effects. But it has been conclusively shown that cancer-cells are not destroyed any appreciable distance from the surface of application certainly not deeper with low heat than with high heat. This was proved by the examination of tissues procured at the autopsies mentioned.

Dr Charles Mayo when discussing the paper alluded to asserted that the proof of the deep destruction of low heat as shown in cases that had been operated upon in the Mayo clinic lay in the fact that at the time of cauterization the disease was too far advanced for the patients to be operated upon radically but later the uterus became mobile and was extirpated, and when these uteri were examined by the pathologist he failed to find any evidence of malignant disease in them. This hypothesis is not accepted by Boldt as valid proof since the mobility may have become impeded by an inflammatory process which as the result of the heat treatment became dried out as it were and mobility of the uterus resulted a result seen also when high heat is used. The inflammatory infiltration may subside but the carcinomatous infiltration remains. To disprove this it is necessary for the operator when the abdomen has been opened to remove a part of the suspicious infiltrated area in the pelvis, a reasonable distance away from the cervix and have it examined by a competent pathologist. If that shows cancer nests and the uterus becomes mobile subsequently so that a radical operation may be done, and the specimen then removed by a radical operation fails to show cancer elements in the parametria then it would be plausible to grant the deep destruction of cancer elements by the heat applied but not until such proof has been shown.

Attention is called to those instances in which recovery followed when a simple extirpation of the uterus had been done, despite some parametrial infiltration and in which after a period of a few months a re-examination failed to show any evidence of infiltration. The author describes two such cases.

Mauchlaire Contribution to the Study of Uterine Gangrene Due to Abortion (Contribution à l'étude des gangrènes utérines abortif es) Ann de gynec. et d'obst 1916 xlii 193

The author's short contribution deals principally with uterine gangrene resulting from perforation caused by instrumental abortive procedures. He divides uterine gangrene into three categories according to the etiology.

1 Uterine gangrene due to metritic gangrenous infection and developing without either traumatism or caustic injection into the uterus. This form of gangrene occurs without any attempt at abortion but it is very rare.

2 Uterine gangrene due to gangrenous infection and occurring in the neighborhood of a traumatic contusion or perforation, the form commonly met with.

3 Uterine gangrene due to caustic injections, this type not usually occurring with instrumental perforation. Mnuclaire quotes a few illustrative cases and shows that whether there is actual instrumental perforation or not the risk of a gangrenous perforation being communicated from the uterus to the peritoneal cavity calls for intervention. Although the conditions for intervention are generally very bad nevertheless he thinks that it is the only chance of safety for the patient. W. A. BECKMAN.

Beckman V B: Two Cases of Uterine Perforation with Issue of Foreign Bodies into the Abdominal Cavity (Deux cas de perforation de l'utérus avec issue de corps étrangers dans la cavité abdominale) Ann de gynec. et d'obst 1916 xlii 206

Both cases reported by Beckman had reference to attempts at abortion but in one of these no actual pregnancy existed. Neugebauer has collected 15 cases in which attempts at abortion were made for a suspected pregnancy which did not exist. Of these 15 women 5 died and in 4 of these foreign bodies were found in the abdominal cavity. Neugebauer thinks that abortive maneuvers in the absence of pregnancy are more frequent than is thought. Beckman points out that recently several such cases have been reported and states that there are now 46 cases in the literature.

Diagnosis of the presence of a foreign body in the abdominal cavity is often difficult and the symptoms arising from such may easily be confounded with other conditions, particularly where the patient as is often the case, will not make an avowal or is ignorant of the circumstance. But if the diagnosis is made it is necessary to operate immediately. The abdominal incision is best because it not only permits the foreign body to be removed, but it also shows whether the intestine is perforated or simply scarified.

Regarding removal of the uterus the author does not believe in the dictum of Schanta that this organ must be removed when there is fear of infection. When the intestine has been perforated but there are no signs of infection evident then intervention should be limited to the removal of the foreign body and suture of the perforation. When there is a foreign body in the abdomen and at the same time incomplete abortion, hemorrhage will necessitate completion of the abortion. The study of cases in the literature however shows that where a diagnosis of this kind has been made intervention can be deferred. W. A. BECKMAN.

Hutchins, H. T.: The Role of the Anteposed Uterus in the Causation of Backache and Pelvic Symptoms. *J. Am. M. A.* 9 6 July 1910.

The first of the author's investigations were carried out in his office and clinic. In every patient examined who complains of backache and lack of support a careful note is made as to the position of the uterus, as a whole in the pelvis. The relative position of the cervix to the symphysis pubis and the labial tuberosities is first noted, no attention whatever being paid to the forward or backward position of the fundus. The extent of the anteroposterior movements is noted in other words the amount of posterior descent of the cervix. In speaking of descent the author means only the posterior descent toward the coccyx and in no way the rotation with descent toward the outlet, a condition which forms an entirely different class of cases. The stability of the lower part of the broad ligaments, the paracervical tissues, and the uterosacral ligaments are tested by grasping the uterus between the examining hands and moving it as far as possible up behind the symphysis and backward toward the coccyx. By this maneuver frequently the ache and drag of which the patient complains, can be reproduced temporarily. This is always a desirable feature in any diagnostic work in which pain is a symptom.

From the examination of a large series of cases the amount of posterior descent is found to vary considerably. The author then places tampons in such a position that the uterus as a whole, and not simply the fundus is forced well forward, up back of the symphysis in the position where a high suspension will hold it. These tampons are allowed to remain for forty-eight hours, during which time the patient is instructed to keep about her normal activities walking, dancing or whatever she pleases. At the end of forty-eight hours the patient reports the result of this experiment. If the backache and drag have been relieved the author feels sure that suspension will give permanent relief. If the backache is not relieved then some other cause for the same must be sought, a cause outside of the position of the uterus in the pelvis. By this means, many cases of sacro-iliac pain and back strain are clearly differentiated from low pain due to uterine descent.

As a result of his studies, Hutchins has been led to suspend many anteposed uteri in which he found descent present accompanied by the classical symptoms of a retroposition and with excellent results.

EDWARD L. CORRELL

ADREXAL AND PERIUTERINE CONDITIONS

Phillips, W. D.: Ovarian Transplantation: Report of Cases. *Texas St. J. Med.* 916 xii, 13

The author reports 12 cases of ovarian transplantation all of the autoplasmic type. This group of cases dates from December 1914, and up to the present time the following results were men-

tioned. In only one of the 12 cases was the uterus removed in this case no further report was obtained. Of the remaining 11 cases, 6 are menstruating regularly every month and without pain. The author mentions that the cessation of pain was very noticeable in those cases which had returned before ovarian transplantation for a second laparotomy because of pain. From the remaining 5 cases the post-operative history was unobtainable. In 3 of the above cases the graft was active and functioning two years after operation.

In this series of cases the following technique was used. After emptying the ovaries they were placed in normal saline solution at a temperature of 60° and the operation completed. After closing the peritoneum sections were made of the most desirable part of the ovary. The size of the graft varied from one-quarter of normal ovary to a section one-eighth to one-eighth of an inch in thickness. The abdominal wall just to the side of the median incision was the site selected as the most favorable for placing the transplant making a pocket just to the side of the median line in the adipose tissue or underneath the rectus muscle. The immediate postoperative history of these cases hardly differed from the average case. In some of them the graft became tender and swollen but in none of the cases did the graft become infected or degenerated. In those cases in which menstruation appeared, it appeared between the second and fifth month after operation.

In conclusion the author says that he is fully convinced that these cases were benefited by the ovarian transplantation and that is more general use in all but cases would not only diminish the cases of precipitated menopause but would lessen the indications for second and even third laparotomies. The ovarian transplant performs its normal function of ovulation, and will continue to do so in the average case for a number of years. Even at the end of this time should the transplant cease to function it will at least have served a part of its duty. The artificial menopause will be less abrupt and the symptoms diminish as the patient has opportunity to adjust herself to her new condition.

W. D. PHILLIPS.

MISCELLANEOUS

Tausig, F. J.: Syphilitic Fever in Relation to Gynecological and Obstetrical Practice. *S. G. & O. G.* 9 6 xiii, 274.

The mention of this symptom in gynecological literature is out of proportion to the comparative frequency of its occurrence. A positive diagnosis of syphilitic fever can only rarely be made but the diagnosis can be made with reasonable certainty in certain groups of cases.

The author divides syphilitic fever into the following groups:

1. Secondary syphilitic fever occurring at the outbreak of the eruption, lasting usually only three

to four days with a rise of temperature to 99.5 or 100 degrees. Fournier estimates that the symptom occurs in 20 per cent of all syphilitics.

2. Late secondary syphilitic fever may complicate pregnancy or gynecological conditions. It is usually prolonged with a higher degree of temperature. The author cites several cases, one of which had been diagnosed as typhoid. In these cases the diagnosis was based upon the positive history and evidence of a syphilitic infection, the exclusion of other febrile diseases and the immediate and permanent results of antisyphilitic treatment.

3. Tertiary syphilitic fever is of greater diagnostic importance than the two previous groups because the symptoms and history of syphilis are often absent and only the 4 plus Wassermann points the way to an interpretation of the continuous fever. Eighty-three cases of tertiary syphilitic fever occurring in the literature are analyzed, including one case in the author's experience in which pelvic gummata were responsible for the fever.

The cause of syphilitic fever is in all likelihood to be found in the entrance of spirochæte-toxins in addition to the organisms themselves into the circulation. Probably individual predisposition is also an important factor in the rise of temperature. The fever occurring occasionally after injections of mercury or salvarsan when it may be fairly assumed that large quantities of endotoxins are liberated from the dead spirochæte is additional confirmation of the interpretation of syphilitic fever as a toxæmia.

Dickinson R. L. Simple Sterilization of Women by Cautery Stricture at the Intra uterine Tubal Openings, Compared with Other Methods. *Surg. Gynec. & Obst.* 1916 xxii, 203.

The author goes into detail concerning all methods such as the loop-holes of danger in each one of the contraceptive measures, the general refusal of the husband to have the vas deferens tied or cut, the rightness of the claim that it is the female who is the one of the pair requiring safeguarding, the uncertainties of the X-ray. He believes one is not justified in opening the abdomen for this purpose alone. The risk to life—however small—is to women who are poor subjects for operation. The nervous stress, the pain, the weeks or months of disability

and the chance of the drag of adhesions may not be lightly regarded. The only outlook for a simple and sure method and that without danger or suffering or loss of time seems to be through closure of the tube where it enters the uterus by a stricture produced as the result of a burn with the fine tipped cautery electrode, a procedure simple enough to be done in the office or dispensary. Seven to ten days following a period under intra uterine novocaine-adrenaline anesthesia, the size and shape of the upper angles of the uterine cavity are carefully measured by the ordinary uterine sound. Then a special sound tipped with a tiny blunt platinum coil, or a round-end fine nasal cautery electrode is passed to this ascertained depth, into the tubal entrance and sufficient heat is applied to produce a slough. The circular scar of this injury contracts and complete closure results. The amount of heat and time required and the progress of contraction are checked up by means of a preliminary control burn on the face of the cervix. To test whether perfect atresia always occurs will call for further study of tubal catheterization and X-ray tubal shadows, and tubal distension tests. So easy a maneuver, herewith to sterilize idiots and other defectives merits extensive trial.

Piccardo T. Hyperovaria in the Etiopathogenesis of Uterine Myoma (La hiperovaria en la etiopatogenia del mioma uterino). *Prensa méd. Argent.* 19 61 87.

Piccardo thinks that there is a relation of cause and effect between fibromatous uterus and different adnexal lesions, such as hypertrophy of the ovary enlargement of the tubes, etc.

Myomata are tumors composed of smooth muscular fiber. The hyperplasia of the fibers of myoma is analogous to that which is produced in the first months of pregnancy during which time there is ovarian hyperfunction.

Also during the prehemorrhagic period of menstruation modifications analogous to myoma are produced in the uterus. Taking these into account as well as the uterine atrophy after cessation of uterine function, the author thinks it sufficiently established that there is a relation of cause and effect between ovarian disturbance and myomatous hyperplasia.

W. A. BRESNAK

rupture the wall of the abscess with a resulting peritonitis. Best results follow the removal of a troublesome appendix at whatever stage of pregnancy it may occur. The presence of pelvic or abdominal tumors complicating pregnancy is also an indication for section. He advises abdominal section as the most logical treatment for premature separation of the placenta, as well as for ectopic gestation. In the author's experience delivery by section in eclampsia however is very rarely indicated.

The author gives a summary of his results with delivery by abdominal section as follows:

The operations consisted of 20 classic caesarean sections, 5 hysterectomies in which the stump was dropped and the abdomen closed without drainage, 3 Porro operations in which the stump was fastened by a clamp in the lower end of the abdominal incision, 3 extirpations of the uterus and sections performed at the moment of maternal death—a total of 216 operations. These cases may again be divided into those that were in fair condition at the time of delivery with no fatal disease of the viscera and apparently uninfected by sepsis and those which were at the time of delivery infected or sullied from some fatal disease affecting the important viscera. Of the former cases in good condition there were 15 with one maternal death—maternal mortality rate of 0.066. Of those cases that were infected and in bad condition there were 60 with 16 deaths—a mortality rate of 26 plus per cent—the mortality of the entire series being 8 per cent.

The one death among those in good condition occurred from peritonitis caused by the bacillus proteus vulgaris.

With the other fatal cases the toxemia of pregnancy in its various phases was the cause of death in by far the greater number of cases. Degenerative conditions of the heart muscle, kidney and liver were the principal visceral lesions in these cases. As regards the fetus, there was no foetal mortality in any case in which the fetus was in good condition at the time of operation and those foetal deaths which occurred were the result of previous attempts at delivery or infection or malformation. (D. HARRIS.)

Wiener: 8; Abnormal Labor. J Am M J 9 6 419 36

In dealing with abnormal labor Wiener advises against the use of morphine shortly before delivery because of the danger of narcotizing the child. In primary uterine inertia, where it is impossible to induce labor by any of the recognized mechanical or chemical stimuli he recommends caesarean section rather than the hydrostatic bag. During the first stage however he thinks that the bag is much preferable to sytutin, which is only allowable after full dilatation of the cervix as a substitute for low forceps.

As long as the patient is making progress the author believes that breech presentation is best treated

by expectancy. He condemns caesarean section in primiparous breech presentation unless the pelvis is abnormal.

Regarding placenta previa, hemorrhage in the simplest marginal type may often be controlled by rupture of the membranes. Should this not be sufficient the hydrostatic bag may be employed. Should the bag fail to check the hemorrhage bipolar version should be done and the expulsion of the child left to nature, as thereby the interests of mother and child are best preserved. This method best meets the exigencies of private practice. Gauze packing before delivery is to be avoided if possible as it predisposes to infection. Caesarean section is often the method of choice in central placenta previa, especially in a primipara with an undilated cervix. F. C. IANNO.

Edgar J. C. Painless Labor. J Am M J 9 6 419 30

The author's conclusions on the subject are:

Nitrous oxide-oxygen analgesia or obstetric ether or chloroform for the second stage of labor pushed to anaesthesia for the perineal stage and, possibly, forceps delivery with vapor anaesthesia to eliminate part of the second stage is a satisfactory procedure.

Morroe or nitrous oxide-oxygen analgesia or anaesthesia is superior to any other during labor because of its oxytocic action.

Eventually an established method of painless labor may be considered among public health questions.

Lessening or abolishing the pain of labor may, the future limit birth control and criminal abortion.

Drug addiction or prolonged drug narcosis or the neuropathic is a possible contingency.

The dangers to the unborn or newly born child are negligible when drug narcosis is limited to the first stage of labor. EDWARD L. CORVILL.

PURPERIUM AND ITS COMPLICATIONS

Blodgett, S. H. Prophylaxis of Puerperal Convulsions. J Am J Obstet 9 6 444, 901

The estimation of the urea is the most valuable and most simple guide we have at present in forecasting the probable occurrence of convulsions.

The estimation of the total nitrogen is of very little practical importance.

The amount of albumin present in the urine is of secondary consideration.

Convulsions may occur where up to the time of occurrence there has been only the slightest trace of albumin in the urine.

The blood pressure is not a reliable index as to the probable occurrence of convulsions except at a very much later stage in the case than the urea output will show.

Where the urea is decreasing below what the normal output should be for that particular patient,

the removal from the diet of meat and fish will usually be followed by an increase in the output of urea and there will be less probability of the occurrence of convulsions.

The clinical symptoms are of secondary importance to the urea output in foretelling the probability of the occurrence of convulsions.

EDWARD L. CORNELL

MISCELLANEOUS

Walscheld A. J. Pelvic Infection. *N. Y. M. J.* 1916 clv 540

The protective resistance to pelvic infection depends on these factors (1) the integrity of the uterine epithelium (2) virulence and number of bacteria (3) the situation, site and their ability to grow and (4) organic resistance.

In broad ligament disease there must be injury and also bacteria as causative factors. Retained placenta, lacerated cervix and septic endometritis are but sites of bacterial invasion through which the true germs enter the parametrial space and the mode of entrance can only be through the muscular wall or contiguous tissue by way of the lymphatics or blood stream. In this way a thrombophlebitic or lymphangitic type of infection may be distinguished.

The course of a typical parametritis can be summed up in the following stages (1) infected area hard to map out but tender and painful (2) edematous soft mass at the edge of the uterus (3) exudate increasing and spreading over the pelvis (4) exudate filling the pelvis in the zones of infection with abdominal tenderness rigidity and uterine displacement (5) temperature pain and tenderness increasing to abscess formation usually on the eighth to tenth day—leucocytosis of 12,000 or over calls for surgical interference (6) cessation of symptoms indicate resolution.

Pelvi peritonitis or parametritis is usually due to dirty douches instruments or plastic operations. This condition is serious as a general peritonitis may result. Peritonitis manifests itself as a serous or a purulent cul-de-sac exudate or an adherent adnexal mass.

In the treatment of pelvic peritonitis curettage should be done only for bleeding or for sapremia. In sapremia the pelvis should be drained, in septicaemia or parametritis the uterus is explored and the pelvis drained. The author never cures when the broad ligament or adnexa is involved. The diagnosis of the condition is thus essential.

W F HEWITT

Belcher D. P. A Child Weighing Twenty five Pounds at Birth. *J. Am. M. Ass.* 1916 lxxvii, 950.

The mother was 35 years of age 5 feet 7 inches in height, weighed 220 pounds circumference at hips 50 inches multipara delivered February 22 1916 had had eight normal children including a twin birth. At birth these children had averaged from 7 to 9 pounds in weight.

Vaginal examination at 8 p.m. during the first stage of labor showed left occipito-anterior presentation. The os was patulous and permitted the introduction of three fingers. The labor pains were of normal frequency but short. After an hour the os admitted four fingers and the pains were still short. The patient was given 5 minims of pituitary extract. The pains became more severe but had little effect on the passage of the head. In two hours the 5 minim dose of pituitary extract was repeated the pains then became strong. The os was normally dilating but there was still slight progress of the head. At 2 a.m. the patient received a third dose of pituitary extract of 15 minims. At 3.30 a.m. the head was born. The posterior shoulder was delivered with great difficulty. Much greater difficulty however was experienced in delivering the anterior shoulder. It required the combined efforts of three physicians to deliver the remainder of the body. The child was a girl weighing 25 pounds it measured 19 inches across the shoulders 28 inches in length, and was perfectly formed. It was born dead. On examination of the mother, the perineum was found slightly lacerated. This was completely repaired by three sutures under chloroform anesthesia. The patient made an uneventful recovery.

EDWARD L. CORNELL

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Key E. Diagnosis and Surgical Treatment of Malignant Tumors of the Kidney (Diagnose und Operation Maligner Nierentumoren) T VI North Surg Cong Goeteborg 9 6 July

Of 26 cases of malignant tumors of the kidneys 8 were inoperable. In the other 18 a nephrectomy was performed. One patient died at the time of operation—severe adhesions, resection of the diaphragm pneumothorax and collapse. Of the tumors 17 were hypernephromata, one a papillary pelvic carcinoma which had spread over the entire kidney. 8 had recurrences or died of metastasis or recurrences. 7 are living and are free from recurrences, from three months to three and one half years after operation. It is necessary to make the diagnosis early. The cardinal symptoms are haemorrhage, pain, and especially a palpable tumor which is present in from 60 to 70 per cent of cases. The X-ray frequently will show a tumor or an enlargement of the kidney not palpable. Not infrequently the patients die a short time after the operation in collapse. The author suggests that this may be due to a quantity of adrenalin being thrown into the circulation from the tumor at the time of the operation and bases this hypothesis upon observations of the blood pressure taken after the operation.

ROVINGS maintained that the collapse after the operation was due to the haemorrhage and to the changed pressure, especially on the left side. A three to four year observation time does not exclude recurrence. The good results as obtained by Rovsing—50 per cent cure after a long period of observation—can be obtained only by carrying out the correct technique. The kidney should be removed *in toto* as an infected mass in the manner described by Rovsing.

BORELIN reported that out of 37 cases he extirpated the tumors in 27. One operative death occurred—difficult operation, severe haemorrhage, collapse. In his series there were 15 hypernephromata, 3 mixed tumors, 1 adenoma, 1 flat cell carcinoma, and 2 cancers undiagnosed. One-third of the patients operated upon died of recurrence. One lived for nine years free from recurrence the majority however were not observed long enough.

LEWIS endeavored to show that the Grawitz tumors were not hypernephromata but carcinomata of the kidney as previously brought out in a lengthy article.

ERKENAN advised the removal of a section for diagnosis in doubtful cases, even in tuberculosis.

In *losing the discus* on MAY stated that he intended with his material to show how early recurrence takes place. He removes the kidney and like Rovsing the connective tissue and glands also which in two of his cases were completely involved. Whether the Grawitz tumor is a carcinoma has as yet not been decided. L. A. JOURNAL.

Noguera, A. Hydatid Cysts of the Kidney (Quistes hidatícos del riñon) Monograph Montevideo 1906

The author's extensive monograph on hydatid cysts of the kidney is the result of a very complete study of the literature of the subject combined with the author's personal experience with eight cases.

The author gathers from the literature 47 cases of hydatid cyst in which nephrectomy has been performed. Of these 10 died, 21.3 per cent. Of 9 operated upon prior to 1900 the mortality was 26.5 per cent of the other 8 operated upon since the mortality was reduced to 17.8 per cent.

Comparing the results according to the method of approach, 26 cases were operated upon transperitoneally with 7 deaths, 26.9 per cent. Five of these deaths occurred prior to 1900. Seventeen cases were operated upon by the lumbar route with a mortality of 22.7 per cent. The author suggests that in many of the cases in which death occurred in operations by the lumbar route intervention was contraindicated. He also believes that the doubts which existed in the time of Boeckel and Housel as to the value of nephrectomy can no longer prevail. When nephrectomy is indicated, that is, when there is sufficiency of the remaining kidney it is a procedure with relatively low mortality.

Granting the sufficiency of functioning of the remaining kidney the author specifies the indications for nephrectomy in hydatid kidney cysts as follows:

In cases in which the total renal parenchyma is compromised by the existence of multiple cysts.

When the renal tissue is so much reduced that the quantity of parenchyma left is incapable of fulfilling the function of urinary elimination, either on account of its state of atrophy or because the anatomic conditions of the gland do not permit it.

3. If lesions such as abscesses, pyonephrosis, tuberculosis, etc. coexist with the cyst which cannot be effectively removed by more conservative methods.

4. When a prior intervention has left a urinary purulent fistula.

The contra indications to nephrectomy are

- 1 Insufficient functioning of the remaining kidney
- 2 Persistence of a sufficient quantity of healthy renal parenchyma in the cystic kidney and which can satisfactorily fulfill the urinary function after extirpation of the cyst
- 3 The amount of adhesences of the cyst to neighboring organs

The author enters at length into the consideration of the conditions under which a partial nephrectomy only is permissible. These conditions have already been generalized by Kuemmel and Albarran with whose views the author apparently concurs. Other operative procedures are also discussed.

The work concludes with the details of 11 new cases. Of these 8 were personal cases of the author's and 3 are cases in the practice of Lamas and Mondino not hitherto published. W. A. BRENNAN

Mertz, H. O. Uronephrosis: Its Significance and Detection. *J. I. Diana St. M. Assn.* 1916, v. 35.

The author defines uronephrosis as a retention of urine in the upper urinary tract and believes that the significance of this urinary stasis is dependent on three things: (1) its effect on the physiologic action of the kidney; (2) its effect on the anatomy of the parts involved; (3) its effect on the residual urine and the results of its absorption.

Under the first heading the early stage of a stasis produces an anemia and atrophy while secretion stops when the intrapelvic pressure becomes 73 mm. of mercury. The degree of back pressure present depends upon the completeness of the obstruction, its permanency and the rapidity with which it is reduced. When the obstruction is sudden complete, and permanent the kidney becomes isolated and its functional value ceases. If but temporary the degree of destruction depends upon the time it has persisted. Functionating kidneys have remained after an obstruction lasting from ten to forty days.

Stasis may produce an effect on the anatomy varying from a slight deviation in the outline of the lower border of the pelvis and of the calices, to a hydronephrosis of 30 liters. Authors vary in their opinion of the effect produced by a sudden complete obstruction of the ureter, some holding that it is followed by slight distention and atrophy of the kidney and others show by experimental work that in complete obstruction of the ureter seldom if ever is there a true primary atrophy but almost invariably a hydronephrosis results.

Under the third heading comes the effect of absorption of a substance poisonous to the system with all the symptoms it produces.

The early detection of uronephrosis is made possible by ureteral catheterization and the proper interpretation of the pyelograms in selected cases. The author believes that urinalysis is of very little value and too much reliance should not be placed on the symptom of pain alone. In interpreting the

pyelogram, if the early case of atasis is to be recognized distention and distortion of the ureter and pelvis cannot always be relied on but a deviation in the flow of urine from the kidney to the bladder must be looked for as an interference with this physiologic action always precedes anatomic change in the non-infected case. Extreme care must be exercised in interpreting at operation lesions of the upper ureter producing stasis. In the pyelographic interpretation in the early case it would appear that a close study of the comparative location of the ureteropelvic junction to the pelvis and the angle at which the ureter enters the pelvis is necessary.

H. L. SANFORD

Smith, R. M. Pyelitis of Infancy. Mode of Infection. *Am. J. Dis. Child.* 1916, vol. 235.

The author gives a very good résumé of the subject with numerous references to the literature. He tabulates the results of his study of 71 cultures made from the vagina, vulva and urethra of 40 infants and young children. This investigation was undertaken to determine if this region was in fact a possible source of infection. All infants over 18 hours old except one showed a growth from vaginal culture. All the vulva and urethral cultures were positive. These findings are in accord with those of Schmidgall while others have found bacilli and cocci in the vagina and vulva of infants in differing proportions.

Smith states that pyelitis of infancy is much more common in female than in male infants the proportion being about three to one. The colon bacillus is the offender in from 50 to 90 per cent of cases. The pathology of the condition is well established. In uncomplicated cases the pelvis alone is involved and there the local lesion is simply a low grade inflammation. Many cases show in addition degenerative changes in the kidney substance due to extension of the process inward from the pelvis.

With these facts as a basis the two theories as to the mode of infection, namely the ascending or urinary and the descending or hematogenous are discussed. The theory of ascending infection gains its greatest support from the large proportion of cases among girls but it is supported by very little experimental work. From his discussion the author concludes that the ascending theory of kidney infection so far as it applies to the pyelitis of infancy has not been proved and the facts are against it.

Infection by way of the blood and lymphatics rests upon surer ground. The usual mode of infection in pyelitis is described as follows: From the intestinal tract or some other source bacteria get into the lymphatic vessels and then into the blood, or possibly directly into the blood. After reaching the kidney they pass through the glomeruli and are excreted at the pelvis. They either pass out of the body without doing damage or they set up an infection at their point of excretion the pelvis. During their passage through the kidney they may cause more or less damage to that organ. Which of these alternatives occur will depend upon the virulence

and character of the bacteria and on the resistance of the individual and of the local tissues.

Colon bacilli because of their low pathogenicity cause little or no damage to the kidney substance in their progress through the organ. Infection of the kidney may take place by extension inward from the pelvis. Permanent damage to the substance of the kidney of greater or less degree results and presents a complication of or sequel to, the usual pathology of the disease. According to the author these various stages are well established.

The intestinal tract is the most likely source of infection in the majority of cases—colon bacilli infection. Extra-intestinal sources of infection such as the teeth tonsils and local septic lesions are important in cases where organisms other than the colon bacilli are found. This statement of the mode of infection in pyelitis satisfies all the conditions observed except the greater frequency of the disease in females. The explanation for this the author finds in infection of the pelvic organs reaching the kidneys through the lymphatics and blood stream. Numerous observers are quoted in support of this view.

The concluding paragraph of the paper states the author's view concisely. I think that we have sufficient evidence to believe that pyelitis is always a blood infection and that the bacteria frequently gain entrance to the blood by the lymphatics. In the uncomplicated cases the lesion remains localized in the pelvis of the kidney where the organisms are excreted. Secondary infection of the kidney substance may occur by lymphatic channels from the pelvis. Quite possibly these secondary infections account for many relapses. The source of infection in the majority of cases, considering males and females together is the gastro intestinal tract. Some cases may arise from infection in the skin teeth or tonsils or from some local septic process. Many cases in females accounting for the greater number in this sex as compared with the males arise from bacteria entering the blood often via the lymphatic from the vulva, urethra or vagina.

H. A. FOWLER

Mossenthal, H. O., and Lewis, D. S. A Comparative Study of Tests for Renal Function; Phenol sulphophthalein, Non Protein Nitrogen and Urea Nitrogen of the Blood, Ambard's Coefficient of Urea Excretion and the Test Meal for Renal Function. *J Am Med Ass* 9:6 April 933

The authors state that the various tests for renal function have their own significance and that a greater insight will be obtained in the characteristics of kidney diseases when physicians no longer advocate one test to the exclusion of all others but will endeavor to interpret each according to its own significance. They classify the renal function tests as follows: phenolsulphophthalein, non-protein nitrogen of the blood, urea nitrogen of the blood, and Ambard's coefficient of urea excretion.

Table one shows the relation between phenolul

phosphthalein, nitrogen, urea and the coefficient of the urea excretion.

The authors then discuss the amount of urea and nitrogen which constitutes the upper normal level of non-protein nitrogen and urea nitrogen of the blood and concludes that the consensus of opinion points to determinations yielding a urea nitrogen figure above 15 mg in 100 cc. of blood as revealing the possibility of nitrogen retention which is at least worthy of closer investigation. The methods of determining the coefficient urea excretion as indicated by Ambard are discussed and the formula given as follows:

$$A = \frac{U}{\sqrt{D \times \frac{70}{P} \times \frac{1}{t}}}$$

in which

A The coefficient of urea excretion

U Urea grams per liter of blood

D Urea grams excreted in urine in twenty-four hours

P = Urea grams per liter of urine

t Twenty-eight in kilograms

70 Standard body weight in kilograms

Standard concentration of urea grams per liter of urine

The authors place the patient on a full diet of regular meals with no fluid or food between times and estimate the renal function by the study of the urinary output from specimens collected every two hours during the day and of a ten hour specimen at night. Observations were made on 200 patients and the summaries of these results are grouped in tables 1, 2 and 3. A general comparison is made of all the tests employed. Table established the following facts:

1. The non-protein nitrogen and urea nitrogen indicate a slighter degree of involvement of renal function than the other tests.

2. Phenolsulphophthalein and Ambard coefficient tend to show an equal degree of impairment of renal function.

3. The test meal for renal function demonstrates a greater degree of depressed function than the other tests.

TABLE 1. DEGREE OF INVOLVEMENT BY THE TESTS COMPARED TO PHENOLSULPHOPHTHALEIN ACCORDING TO THE SCALE OF TABLE

| Degree Variation from Normal | Non protein Nitrogen | Urea Nitrogen | Ambard's Coefficient | Test Meal |
|------------------------------|----------------------|---------------|----------------------|-------------|
| ++ | per cent | per cent | 6 per cent | 1 per cent |
| + | per cent | 10 per cent | per cent | 15 per cent |
| Same | 45 per cent | 45 per cent | per cent | 34 per cent |
| - | per cent | per cent | per cent | per cent |
| --- | per cent | 3 per cent | per cent | per cent |
| Total cases | 85 | 76 | 46 | 15 |

1. This table + signifies degree greater than normal and - degree less. All the cases observed except those which were same, are grouped together in this table.

Table 3 shows the relation of the non-protein nitrogen and urea nitrogen of the blood and Ambard's coefficient

TABLE 3.—COMPARISON BETWEEN THE DEGREE OF INVOLVEMENT OF RENAL FUNCTION AS SHOWN BY THE NITROGENOUS PRODUCTS IN THE BLOOD, AND AMBARD'S COEFFICIENT

| Degree of Impairment as Measured by Non-protein Nitrogen and Urea Nitrogen | Total Number of Cases | Percentage of Cases Exhibiting the Given Degree of Impairment of Renal Function, as Indicated by Ambard's Coefficient | | | | |
|--|-----------------------|---|---|----|-----|------|
| | | | + | ++ | +++ | ++++ |
| + | 55 | 57 | 7 | 6 | | |
| ++ | 61 | | 9 | 43 | 41 | 5 |
| +++ | | | | 1 | 10 | 31 |
| ++++ | 0 | | | | 7 | 91 |

Table 4 is also of interest and value.

TABLE 4.—THE EFFECT OF LOW PROTEIN DIET ON THE LEVEL OF PROTEIN TO UREA NITROGEN IN THE BLOOD

| Before Low Protein Diet | | After Low Protein Diet | | Diagnosis |
|-----------------------------|----------------------|-----------------------------|----------------------|------------------|
| Non-protein N Mlg per 100 C | Urea N Mlg per 100 C | Non-protein N Mlg per 100 C | Urea N Mlg per 100 C | |
| 26 | 7 | 6 | 7 | Sec. Cont. Kid. |
| 36 | | 10 | | Chr. Diff. Neph. |
| 47 | | 10 | | Chr. Diff. Neph. |
| 97 | 6 | | 5 | Sec. Cont. Kid. |
| 41 | 26 | 1 | 1 | Sec. Cont. Kid. |

A comparison is made of the degree of impairment of function in 73 cases of all classes except anemia in which all the tests were carried out expressed in the percentage of the total figure

TABLE 5.—COMPARISON OF DEGREE OF IMPAIRMENT OF FUNCTION IN SEVENTY THREE CASES ALL CLASSES EXCEPT ANEMIA IN WHICH ALL TESTS WERE CARRIED OUT EXPRESSED IN PERCENTAGE OF THE TOTAL FIGURES

| Degree of Renal Impairment according to tests | Phenol sulphophthalein | Urea N of Blood | Ambard Coefficient | Test Meal |
|---|------------------------|-----------------|--------------------|-------------|
| + | 8 per cent | 40 per cent | 1 per cent | per cent |
| ++ | 45 per cent | 5 per cent | 5 per cent | 7 per cent |
| +++ | per cent | 4 per cent | 5 per cent | 7 per cent |
| ++++ | 4 per cent | 7 per cent | per cent | 29 per cent |

TABLE 6.—CASES OF CHRONIC NEPHRITIS AND HYPERTENSIVE CARDIOVASCULAR DISEASE LA SHOWN BY NON-PROTEIN NITROGEN AND UREA NITROGEN IN THE BLOOD, AND AMBARD'S COEFFICIENT

| Diagnosis | Phenol Sulph. Per Cent | Urea N of the Blood Mlg per 100 C | Ambard Coefficient | Degree of Impairment of Renal Function (by Test Meal) |
|-------------------------------------|------------------------|-----------------------------------|--------------------|---|
| Chronic diffuse nephritis | 7 | 8 | 0.64 | + |
| Chronic diffuse nephritis | 75 | | 0.54 | + |
| Chronic diffuse nephritis | 80 | | 70 | + |
| Chronic diffuse nephritis | 70 | 8 | 0.68 | + |
| Hypertensive cardiovascular disease | 70 | | 0.68 | + |
| Hypertensive cardiovascular disease | 63 | | 0.50 | ++ |
| Hypertensive cardiovascular disease | 70 | 0 | 0.50 | + |
| Hypertensive cardiovascular disease | 85 | 0 | 70 | + |
| Hypertensive cardiovascular disease | 67 | 0 | 17 | ++ |
| Hypertensive cardiovascular disease | 6 | | 0.50 | ++ |
| Hypertensive cardiovascular disease | 65 | | | ++ |
| Hypertensive cardiovascular disease | 75 | | | ++ |
| Hypertensive cardiovascular disease | 64 | | | ++ |
| Hypertensive cardiovascular disease | 60 | | | ++ |
| Hypertensive cardiovascular disease | 67 | | | ++ |
| Hypertensive cardiovascular disease | 67 | | | ++ |

In table 6 the author gives the following conclusions

1 The tests in order of their positive appearance are the test meal phenolsulphophthalein Ambard's constant urea nitrogen of the blood

2 A maximal involvement is most frequently seen in the test meal less frequently in the phenol sulphophthalein test and least often in Ambard's coefficient

Table 7 shows the relation of chronic diffuse nephritis and hypertensive cardiovascular disease showing a normal or supernormal response to phenolsulphophthalein and Ambard's coefficient while the test meal shows some impairment of function.

The results of test meals for renal function in primary and secondary anemias are discussed and the article closes with the following summary

1 A scale of impairment of renal function is proposed, according to which the tests may be measured. Such a graduation calls to the attention of the clinician the relative degree of involvement as shown by different procedures. Inasmuch as each of them has a significance apart from the others comparison according to this method is an extremely valuable aid in the treatment and prognosis of diseases of the kidney

2 The level of the non protein and urea nitrogen of the blood must be estimated largely as the result of three factors kidney efficiency diet and protein destruction. In judging of prognosis when these substances are high in the blood of nephritics due regard must be given as to whether their accumulation is brought about by retention alone or through retention coupled with protein destruction. The former offers a comparatively better prognosis than the latter

3 The Ambard coefficient is a better method of determining the ability of the kidney to excrete urea than the level of this substance in the blood

4 The progress of renal disease is probably followed most minutely by means of the phenol sulphophthalein excretion and Ambard's coefficient as these tests furnish figures in which even small variations are of significance

5 The test meal for renal function or the tests employed gives the earliest indication of diminished kidney efficiency. It likewise reaches the maximum degree of impairment before the others

6 Each test for renal function covers only a limited range of the kidney's activities. It is therefore a mistake to speak of any test as measuring renal function as a whole. The aim should be to develop a proper interpretation of the old tests and easily applied new ones in order to obtain a true guide to the treatment of diseases of the kidney

A C STOKES.

HUNNER G L.: Stricture of the Ureter. J. J. 1916 ch. 5

On the basis of an analysis of 50 observations Hunner concludes that the most important factor in

the etiology of ureteral strictures excluding those of tuberculous and stone origin is an infection carried to the ureter walls from some distant focus such as diseased tonsils, sinuses, or teeth. This conception of stricture postulates that ureter infiltration is almost always primary and that complicating urinary tract lesions, such as hydronephrosis, pyelitis, and pyelonephritis, are secondary lesions.

Only 2 of the author's series of 50 cases were found to be due to gonorrheal infection. In 28 cases infected urine was formed, but in only 3 instances was stricture due to cystitis encountered. In one case there was an evident sequence of ureteral stricture following a pyelonephritis, which according to the author's concept on was due to system c rather than to local infection.

Congenital abnormalities apparently do not play an important rôle in a large proportion of cases of ureteral stricture, since Hunner could not in any of his cases trace a congenital origin. The average age of his 50 cases was 35.5 years and the average duration of symptoms was 4.5 years making the average age at onset of symptoms 31 years.

Suggestive of connection with the so-called rheumatic diathesis are 9 cases with a previous history of rheumatism and 3 cases with a history of heart lesions.

The occurrence of 1 case of bilateral stricture and the preponderance of cases in which the stricture occurred in the broad ligament region, where the ureter has its chief blood and lymphatic supply, are suggestive of ureteral stricture becoming established on the basis of a systemic infection. Of the 62 ureters with stricture, 2 of which were bilateral the stricture was located within the broad ligament within 6 cm. of the bladder in 53, near the pelvic brim in 8 and near the kidney in 1 ureter.

The most important symptom of ureteral stricture is pain in the kidney region or bladder and the stricture is generally found in the attempt to fathom the cause of these symptoms. Only occasionally a local point of pain in line with the ureter is found to be coincident with the site of the stricture. The correct diagnosis in these cases depends upon negative radiographic and cystoscopic findings for ureteral stone and upon the localization of an obstruction upon the passage of an ureteral bougie. If the ureteral stricture is not of sufficient density to cause an appreciable obstruction to the passage of the bougie on the first examination, the diagnosis may be suspected because of an existing hydronephrosis. In some instances, also the first strong suspicion of stricture may be based upon the occurrence a few hours after ureteral catheterization, of an unusually severe attack of pain or in the presence of infection of a severe attack of pyelitis. By using a consecutive examination, large wax bulb a definite point of obstruction marking the stricture area can be ascertained. Intermittent attacks of colic in such cases of incipient stricture are particularly prone to occur at the menstrual period on account of a kided congestion or occasion

ally on the basis of congestion following getting chilled catching cold etc.

In women an area of thickening can often be palpated through the vaginal vault. Cystoscopy quite frequently reveals an ordematous and congested ureteral orifice.

Intermittent attacks of renal colic, due to ureteral stricture may exist for years without the development of a permanent hydronephrosis. A pyelitis that is stubbornly resistant to lavage treatment may be suspected of being due to the presence of stricture of the ureter and particularly so if these lavage treatments are followed by acute pyelitis attacks with high temperature chills, pain, nausea and vomiting.

The non-infected cases of Hunner's series gave as a rule a history of shorter duration and showed renal pelvises holding less fluid than the cases with infection. In 16 non-infected cases the average duration of symptoms was two and a half years, and the average size of the kidney pelvis in 10 of the cases was 9 cm. In no exceptional case the pelvis had reached a capacity of 360 ccm. without becoming infected. In 18 infected cases the average duration of symptoms was 4 years, and the average size of the kidney pelvis in 15 such cases was 98 ccm.

The ideal treatment of stricture of the ureter is by dilatation from the vesical approach. Hunner's work being confined to women, the methods in treating ureteral stricture as developed or suggested by H. W. J. A. Kelly are discussed in this article, the careful perusal of which will demonstrate the value of these non-operative forms of treatment. In cases without infection and without such renal dilatation a cure can be effected by these means and even in such with infection if the kidney pelvis is not materially dilated occasionally brilliant results may be obtained in permanently clearing up symptoms and infection through dilatation and lavage. In cases with infection and large renal pelvis patients may be rendered to apparently perfect health by eliminating ureteral obstruction, thereby relieving pain and other symptoms.

If all conservative methods of vesical approach fail, percutaneous relief must be considered. In the presence of late stricture with a kidney of little or no functional value removal of the impaired or dead kidney is indicated, as carried out in 6 of Hunner's cases with entirely satisfactory results. In the presence of a stricture located high, at the junction of the kidney pelvis with the ureter some form of pyelo-ureterostomy or partial pyelotomy or high ligation of the kidney in connection with pyelotomy after careful dilatation of the narrowing at the pyelo-ureteric junction, will generally bring the desired result. If the stricture is lower and about the lumbar or pelvic brim region ureterotomy above the stricture should be followed by implantation of the upper end of the ureter into the colon or in the loin region. For lower strictures near the bladder which so far have been treated with implantation of the severed healthy end into the colon or bladder

with indifferent or questionable results, Hunner recommends the treatment by retrograde dilatation. The ureter is exposed by an extrapentoneal incision and the incised portion of the channel is dilated with increasing sizes of the French gum elastic bougies or metal sounds are passed until the stricture is dilated to a diameter of from 0.5 to 1 cm. The ureteral incision is then either closed at once, or in case of unsatisfactory dilatation or undue traumatism of the ureter left open temporarily to favor urine drainage. In 6 of Hunner's 8 cases treated in this manner by retrograde dilatation, perfect results were obtained so far as measured by relief of symptoms and ability to catheterize from below.

Least suited for retrograde dilatation are the cases in which a pyelographic absence of enlargement of the lumen above the site of the stricture has been ascertained. In these cases a long and tedious course of bougie treatment from the vesical approach may finally yield satisfactory results.

M. KROTHVIER

BLADDER URETHRA, AND PENIS

Rubin I. G.: Bladder Symptoms in Women, with Special Reference to Associated Gynecological Pathology. *Urol & Gynec Res* 1916 11 508

In a series of 10,000 consecutive gynecological cases at the Mt. Sinai Hospital 875 cases gave bladder symptoms as their chief complaint. Frequency of urination is the most common symptom. This may be due to physiological changes such as diet and weather but more frequently originates in a pathological condition. Painful urination, burning difficulty in starting the urinary stream, complete partial or relative incontinence are present alone or associated. Hematuria, concentration of urine or pain in the hypogastrium are sufficient to require an examination.

Correct interpretation of the urinary symptoms requires a complete examination. The personal history should be carefully taken as the first step. The second step is physical examination. Inspection of the external genitals for eczema, excoriations, intertrigo, clitoris hypertrophy, enlarged nymphs, purulent discharge from urethra and vagina, pus at the skene duct orifices, cystocele, urethral prolapse or a caruncle may be present as a cause of the symptoms. Dribbling may be present. Hypospadias is rare.

By palpating in the vagina, swelling in the urethra, tenderness in the trigone, foreign bodies, tumors and tenderness along the ureters may be detected. By palpation gynecological lesions which cause bladder symptoms either by pressure or which extend into the bladder and urethra by contiguity can often be outlined. An acutely anteverted uterus, as in early pregnancy, by pressure and venous stasis may cause bladder irritation and even bacterial invasion. Extreme retroflexion will give the same results. Cystoscopy will give a good picture. Tumors, especially those low down in the pelvis

will cause bladder irritation and will cause vascular obstruction. Incarcerated ovarian tumors may do the same. Advanced carcinoma of the uterus affects the bladder and ureters in 10 to 30 per cent of the cases. Inflammatory conditions of the broad ligament with large exudates frequently extend into the bladder. Pyosalpinx, ectopic pregnancy with hematocele formation, and infected dermoid ovarian tumors may cause urinary trouble. Pelvic or general peritonitis and pelvic hematocele are usually accompanied by bladder disturbances. A diseased appendix, sigmoid, or rectum not infrequently causes vesical lesions.

Cystoscopy and urethroscopy are the deciding steps in bladder and urethral examination. Divergent distortions of the bladder from a tumor mass, varicosities of the mucosa causing hematuria, trabeculae resulting from overtraining, local or general cystitis with ulcerations, hemorrhage due to various causes, foreign bodies, tumors such as polypoid papillomata, and carcinomata can be inspected. Sections can be obtained from tumors for microscopical examination.

Smears should be made from all urethral and vaginal discharges for gonorrhea. The colon bacillus is frequently a complication. Typhoid, influenza, pneumonia, diphtheria, and tuberculosis may cause cystitis. Tubercular cystitis is diagnosed by finding the bacillus in the catheterized urine. Pyuria with acid reaction but free from bacteria is suspicious of tuberculosis.

The different bladder conditions may give rise to a series of symptoms which may resemble different pathological lesions. The real cause must be thoroughly searched for and located. Vaginal and pelvic examination followed by urethral, bladder and kidney investigation, and if necessary laboratory confirmation, are necessary for a satisfactory diagnosis.

C. D. PICKRELL

Rovsing T.: A Method in the Operative Treatment of Extrophy of the Bladder (Eine Methode zur Operation von Ektopia vesicae). *Tr XI Nordt Surg Co* 1 Götting 1916 July

Rovsing discussed the various methods employed for cure of extrophy of the bladder and concluded that it was best to abandon the hope of being able to establish normal relations and that it was perhaps better to sew the bladder around a Pezzer catheter as was formerly advised by him. In one case in which extensive cicatricial tissue was present from previous operations and prevented the employment of this method he made a colostomy on the left side and after extirpating the bladder sewed the trigonum into the closed rectum and obtained a very satisfactory result.

L. A. JENSEN

Peacock, A. H.: A Bladder Suture. *Surg Gynec & Obst* 9 6 1916 364

The difficulties encountered in closing the bladder are its low lying position in the pelvis, the thick abdominal walls and tearing of the bladder after

it has been incised. Pre-incision anchor sutures tear out and are only retractors. The purse-string suture is inserted before the bladder is punctured. It prevents further extension of the incision by ripping. It makes final suturing of the bladder unnecessary. It saves valuable time, and it checks bleeding from the large veins of the external surface of the bladder and makes a dry wound which is urine free.

GENITAL ORGANS

Elsendrath D N Undescended Testis. 4
Surg Phila., 916 July 31

The arrest of the descent of the testis is probably due to a combination of causes no single one of which will explain every case. There is no longer any question that the vaginal process does not play any part in its descent. Buedinger has advanced the view that adhesions as the result of fetal peritonitis play an important part in the non-descent although Uffreduzzi has attempted to explain the arrest as a reversion of type. Others believe that a very short mesorchium suspending the testis prevents the organ from migrating. The author offers as a contributory cause the deficiency in the development of the arching fibers of the internal oblique muscle and a weak conjoint tendon, serving to allow retraction of the testis by the cremaster muscle.

Of the complications of non-descent of the testis hernia is by far the most frequent as almost every case has a hernia as an accompaniment. Investigations have clearly shown that there is a marked atrophy of the secretory functions of the retained testis. This atrophy begins quite early so that the author advises operation at as early an age as the condition of the child will permit the lowest limit being about two years. Tumor formation, torsion, and the usual complications of congenital hernia are not very rare and must be taken into consideration in weighing the question of operation. Hypopituitarism is not the result of non-descent but it not infrequently accompanies the condition. The operation has but little influence upon the lack of development of male sexual characteristics, so that a guarded prognosis should always be given for such cases as well as the possible development of the testis after operations in young adults. The author has used the Bevan operation in most of his cases and believes it to be by far the best operation to employ. G. T. WOOD.

Squier J B Rhabdomyoma of the Prostate.
Surg Gynec., & Obst. 9:6 July 31

Squier reviews the reported cases of sarcomata and rhabdomyomata of the prostate and draws attention to the fact that some of the spindle-cell sarcomata should be more properly classified under the rhabdomyosarcomata. The infrequency of rhabdomyoma of the prostate is emphasized by the report of Wolfenberger who collected 63 cases, 38 of which involved the urogenital system, but none

involving the prostate. Kaufmann's three cases are summarized in detail and to these Squier adds a report of a case coming under his own observation.

The patient was 40 years of age and when first seen the tumor was apparently primary in the prostate and had not extended beyond the limits of its capsule. A wide perineal extirpation of the gland and vesical neck was performed, according to the technique of Young. The immediate operative result was excellent the patient not having even urinary incontinence.

Two months after operation a rapid recurrence took place and fatal termination was the outcome. Painless hematuria was the only symptom prior to operation. It had been manifest for three months before the patient had submitted himself for examination.

Borchgrevink, O Prostatectomy T. V. Verh.
N. G. Cong. Goeteborg, 9:6 July

The advances made during the last few years in the operation of prostatectomy consist in the two-stage operation (preliminary suprapubic cystostomy and catheter), careful attention to hemorrhage (tamponade and suture), good drainage (either by means of a wide suprapubic opening or by means of Pezzer catheter), and especially in the employment of local anesthesia (either epidural, sacral par sacral, or better still the direct anesthetic injection of the prostate and surrounding structures). Recently the author has also performed vasectomy for the prevention of epididymitis.

Of 4 cases 6 were operated upon perineally. The high mortality rate is due to the fact that the indications for the operation were carried too far. As has previously been mentioned by Israel the perineal operation permits poorer drainage than the suprapubic. Seventy patients were operated upon suprapubically with a mortality of 3 per cent. In 20 cases suprapubic fistula was made.

In 3 cases the operation was complicated by a bladder abscess and in others the seminal vesicles were removed with the prostate. No serious hemorrhage was present in any case and if the operation is performed under local anesthesia it is almost bloodless. In the last 23 cases no tamponade of the bed of the prostate was done. Hemorrhage did not occur. Complications during convalescence outside of the common ones (as pneumonia, bronchitis, embolism) were epididymitis. Infection of the abdominal wound, urinary retention with fever, urethritis after introduction of a catheter, and stricture of the urethra. In one case the edges of the bladder wound closed up over the bed of the prostate necessitating excision.

Indications for the operation are catheter life, transient total retention, ischuria paradoxa, and prolonged and increasing urinary disturbances. In those cases in which the general condition is poor in bronchitis, and in advanced arteriosclerosis, operation can be performed occasionally but only

without narcosis and after thorough preliminary drainage of the bladder and feeding of large quantities of fluids and after the administration of urinary antiseptics. In severe urinary infection or where there are symptoms of urinary insufficiency (polyuria specific gravity below 1010 low nitrogen excretion) and in gastro-intestinal anemia operation may be performed occasionally. Cancer was found in 9.7 per cent (14 cases) of cases. In 7 cases the diagnosis was certain on account of the decreased mobility of the prostate. The operation in cancer should be performed only where there is a possibility of removing it entirely otherwise symptomatic treatment should be given.

TENOWALL reported 100 transvesical prostatectomies performed for urinary retention. In the first 50 cases lumbar anesthesia was employed—3 per cent tropococaine solution. This was his continued however on account of severe poisoning cases and one death due to it and was followed by local anesthesia in combination with light ether narcosis. The author filled the bladder with air before the operation followed Frey's technique principally and used Kuemmel's after treatment.

Among the 100 cases there were 12 deaths 11 per cent. In 80 cases a good result was obtained. The author operated if after a preliminary retention catheter treatment lasting two weeks there still was 200 ccm. of residual urine or if the urinary attacks were severe occasionally also after acute attacks of retention for social reasons. All patients however who had prolonged retention or showed signs of urinary poisoning or infection of the urinary tract were treated with the permanent catheter for a long time previous to operation, and if the symptoms did not cease the operation was not performed. After the operation a catheter is inserted in the urethra in addition to the wide suprapubic drain and irrigations of the urethra around the catheter are employed freely to avoid epididymitis. To avoid stricture sounds are introduced once a month for six months after the operation. In one case the bladder wall had closed completely over the internal urethral orifice.

In 9 cases a probable diagnosis of cancer was made clinically. In cancer of the prostate the radical operation by the perineal route should be performed the author however resorted to palliative treatment only.

ERIKHORN stated that he had a mortality rate of 11 per cent the patients themselves demanding the operation. The time of cure is about thirty days. The result is good 16 patients do not have to void urine at all during the night 12 patients only once 7 patients twice and 6 more than twice. Infection of the urinary passages is no contra indication. Cancer of the prostate is common as it is difficult to diagnose early operation is necessary. Recovery in cancer is just as rapid and the functional result is just as good temporarily as in the other cases.

EUREN performs partial removal occasionally in parenchymatous hypertrophy. He always em-

ploys the transverse incision through skin and fascia (occasionally also a small incision through the muscle) transverse incision through the bladder and drains from one corner of the incision. In infected cases irrigation of the urethra and bladder are employed before operation.

VOY HOLST analyzed the material of Prof. Dahlgren from the Sahlgren Hospital including 142 cases of prostatic hypertrophy. Of these 42 or 29.6 per cent were operated upon under local anesthesia the others with lumbar anesthesia. Twenty-eight were operated transvesically 3 transperineally 10 with cystostomy, 1 with vasectomy. The mortality rate with transvesical prostatectomy was 11.9 per cent. Of the non-operated cases 8 per cent died. The duration of convalescence was 20 days. The functional results were good—8 patients do not urinate at all during the night 3 once 4 twice and three times.

RIEL performed 40 prostatectomies (2 perineal) with a mortality rate of 10 per cent and 12 cystostomies with a mortality of 50 per cent. He operates under local and sacral anesthesia. Complications after operation are frequent 75 per cent. Cancer was found clinically or by the microscope in 15 per cent of cases. If the diagnosis of cancer is certain only a cystostomy is performed. The hard consistency of the prostate is the most frequent symptom.

BAUER examined 22 out of 27 extirpated prostates and found cancer in 5 cases 22 per cent. Although the material is small it nevertheless shows about the same percentage of cancer as do larger series. One must therefore figure on a fair percentage of cancer cases in all prostatectomy operations even though the clinical symptoms point to a simple hypertrophy.

ROVINO stated his belief that it is certain that the hypertrophy arises from the para urethral glands as the prostate surrounds the hypertrophy and the patients therefore do not become impotent after the operation. He therefore does a total removal more frequently than formerly but has had only 60 cases so far with 10 fatalities. In 11 operated cases the result was bad (retention bladder stone stricture of urethra). He has performed 130 cystostomies however and he always advocates that this should precede the removal of the prostate it being especially indicated in pyelitis to decrease the virulence of the infection. If the patient desires it later a removal operation may then be performed as the operative mortality is from 10 to 20 per cent and recovery can never be guaranteed. The aseptic cases with kidney insufficiency frequently deceive one and are best treated with cystostomy. He protested emphatically against the filling of the bladder with air on account of the danger of embolism.

SCHILLING has performed 30 prostatectomies. After the operation 3 cases of cancer were found among them. He is very well satisfied with parascapular anesthesia and finds local anesthesia of the pros-

tate too complicated. The results are good. In case of hemorrhage he tampons for 15 minutes. The bladder wound is closed completely around a large drain which empties into a bottle and the drain is removed after six days. In 3 cases he closed the bladder primarily without drainage.

WESSER operated upon 20 cases without a death but chose for operation only cases which were not infected. Cases of the soft succulent form which bleeds easily were helped considerably by a vasectomy as mentioned by Rovsing. The prostatic part of the urethra is not only lengthened by the hypertrophy but it is also dilated (Lengdorf) so that a pocket forms which is pin toward the bladder and easily leads to a cystitis.

BOERLIER demonstrated a large prostate — 455 gm — removed through a transverse incision under sacral anesthesia in combination with local anesthesia.

KLY does not consider the operation clinically diagnosed cases of cancer as absolutely hopeless. All the fascia and connective tissue of the pelvis are removed. Of 3 operated cases 1 has lived one and one half years without recurrence and 1 for one year but with recurrence.

FLODRUS reported 50 re-nuclei of prostatectomies with a mortality of 4 or 8 per cent. In 3 cases the operation was very prolonged because of adhesions.

FORELL employed local anesthesia of the prostate in 57 cases with deaths. Before enucleation of the prostate the author made a circular dissection of the bladder mucosa and with this procedure never had a strict result. He never employed a residual catheter after the operation.

TANDERG attended the indications for the operation and the effect also has a high mortality. Among 14 cases there were 5 cases of cancer. In one case the prostate weighed 500 gm. Local anesthesia had been disappointing and he therefore employed ether in preference. All operated patients except one preserved their sexual functions.

BACKER GROENOUW mentioned the methods of determining the function of the kidneys before operation. By means of curves he showed the diuresis, nitrogen excretion, specific gravity, albumin and phenolsulphophtalein excretion. A definite decrease in the excretion of these substances occurred especially of the last after a cystostomy as the retention of the retention influences the kidney. A later prostatectomy produced no shock.

KUREV criticized the employment of cystostomy. He considers it an unbearable procedure requiring careful nursing and later causing infection of the urinary passages and stones.

SANDBERG stated that while most operators control hemorrhage with tampons he employs gelatin injections and irrigation with adrenalin solution through a No. 12 catheter. Later locally irrigates to remove coagula.

TENOWALL answered Rovsing's argument by saying that the unpleasant flooding of the operative field by blood can be safely avoided by the employment of air. If the operation were performed only on the non-infected, only a very few cases would be operated.

ROVINGA contended for cystostomy and explained the after treatment. The catheter must be changed about every six weeks in changing it one risks infection. Therefore it is necessary to follow the introduction of it with an injection of lapar, other wise no irrigations should be employed. With the first sign of infection another injection of lapar should be given. Those patients who find a cystostomy my object on bladder always have an ectomy performed later.

BURKHARDT closed the discussion by again recommending the two-stage operation. The infection may first be taken care of by a cystostomy. In the sense of making the urine sterile but to discontinue the infection until it is cured. Nevertheless, after successful cystostomy operation the ectomy may be followed by urinary uremia. The infection of the bladder wound can be avoided if it is left wide open. In regard to hemorrhage he recommended that if one did not like to operate, one should not have any. The question of performing the operation is a problem sometimes making itself felt by the patient.

L. A. J. WILKINSON

MISCELLANEOUS

PAYSON, R. L. J. and McENIDER, W. B. The Surgical Problem of Unilateral Symptomatic Hematuria: Its Cause and Surgical Relief. *J. Am. Med. Ass.* 1914, 10: 108.

The authors report the conclusions in regard to so-called essential hematuria. These conclusions are based upon a study of cases of the disease in man and also upon experimental work in dogs. Of the human cases the kidney was removed and could be carefully studied in three. The authors do not state how the urine was produced in the dogs. In all the cases studied no overgrowth of connective tissue caused probably by localized inflammation was demonstrated in the corticomedullary junction. It is believed that this fibrosis caused a congestion of the venules which lie beneath the mucosa of the papillae. Sections through this region also thrombosed. In one two instances ruptured vessels. The authors recommend trying the effect of styptics on the renal pelvis, provided the case can be kept under observation. Tuberculous and tumor must be ruled out. If this measure fails, nephrectomy should be done. Cure resulted in every one of 8 cases in which this method was used. They do not consider nephropexy or decapsulation to be sufficient thorough for this condition.

(C. C. SMITH)

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Watson Williams, P.: *The Technique of Sphenoidal Sinus Exploration for Meningococcal and Other Infections*. *Bristol Med-Chir J* 1917 xxxiv 21

Because of the possibility of the sphenoidal sinuses being the source of systemic infection with the diplococcus of Weichselbaum the author advises routine exploration of these sinuses in all cases in which the meningococcus has been found in the cerebrospinal fluid removed by lumbar puncture and in those in which the organism has been found in the nasopharynx and is associated with symptoms suggesting infection.

The sinuses may be explored by passing a cannula through the natural ostium or through the thin anterior wall. The author prefers the latter method for the following reasons:

1. It is hardly possible to pass a mop or cannula into the sinus without previously or subsequently contaminating it while passing through the narrow olfactory fissure in which case the culture yielded may be misleading.

2. If one uses a cannula and suction syringe and the orifice of the sinus is small the cannula so fills the ostium that neither air nor fluid can enter or escape and no contents can be withdrawn as there is no hunghole.

For gaining entry through the natural ostium, the author uses a short silver eustachian catheter size No. 1 with the distal end bent downward for three-fourths inch in a slight curve. The catheter is passed upward and backward between the septum and anterior end of the middle turbinate and kept close to the roof of the olfactory fissure till the nozzle impinges against the anterior sinus wall when the curved end is turned slightly outward and the ostium felt for. As soon as the cannula is in the sinus one should try to force the downward curved nozzle in its further passage backward downward toward the floor of the cavity.

In gaining entry through the anterior wall the author uses a blunt trocar and cannula, directing it upward and backward so as to aim about one inch behind the center of the back of the eyeball. On reaching the anterior face of the anterior sinus wall the proximal end of the cannula is raised and the distal end pressed into the sinus.

Having previously drawn about 6 ccm. of sterile water into the suction syringe the syringe nozzle is inverted into the cannula and about 3 ccm. of water is thrown into the sinus and at once slowly withdrawn. The purpose of the water is to dilute

thick pus or mucus which could not otherwise be aspirated. The contents should be cultured.

Otto M. Rorr

Bryan J. H.: *The Relation of Diseases of the Accessory Sinuses to Diseases of the Eye Especially in Children*. *Tr. Am. Laryngol. Ass.* Washington 1916 May

Diseases of the sinuses occurring in children have been only slightly considered for the reason that these cavities in the very young are supposed to be so small that there could not be an inflammation sufficiently severe to cause any serious disturbance of the eye.

That these premises are entirely wrong is evidenced by the report of the following cases:

The first case a male aged eighteen months had a very marked exophthalmos on the left side following an infection from influenza. On admission to the hospital his temperature was 104, some secretion flowing from the left nostril, marked bulging of the left eye downward and outward, lids and conjunctiva were edematous and the periauricular glands were enlarged. Seen by the author in consultation the diagnosis of orbital abscess resulting from an infection through the ethmoid cells was made.

The radical operation was then done, the incision commenced at the junction of the middle and outer third of the supra-orbital ridge and was carried inward and downward along the inner border of the nose below its middle. The periosteum along the inner wall and the corresponding parts of the roof of the orbit was stripped from the bone and in doing so a large quantity of pus was evacuated. The whole of the inner wall of the orbit was removed back as far as the apophysis. The ethmoid cells were found to be badly diseased especially the middle and posterior portion and from the condition found it was apparent that the orbital abscess resulted from a direct infection from the middle and posterior ethmoid cells. The amount of pus evacuated was enormous considering the age of the child and the stage of development of these parts at this age. The abscess having been thoroughly evacuated a strip of iodoform gauze was placed in the orbit back of the eye and brought out through the nose and a small gauze drain was placed just inside of the inner canthus and the external wound closed by interrupted sutures. The child made an uninterrupted and quick recovery the eye gradually receding soon assumed its normal position. This is the youngest patient the author had ever seen with such diseased conditions.

The second case a negro boy aged eleven years

had bulging of the left eye to a marked degree downward and outward. There was no pus anywhere within the nose and no signs of caries or necrosis. X-ray examination showed no abnormality except that the left orbital cavity was apparently filled with a dense mass which seemed confined to the orbit. Because of all these negative examinations it was believed that there was a growth in the orbit back of the eye.

An exploration of the orbit showed that at the junction of the middle and posterior portion there was a decided bulging of the ethmoid toward the orbit. With a probe the cells were perforated and a large quantity of pus was evacuated. The whole of the inner wall of the orbit including all the ethmoid cells was removed as far back as the sphenoid and in doing so a large abscess involving the posterior ethmoid cells and the sphenoid sinus was found. The sphenoid cavity was unusually developed and filled with thick creamy pus. All diseased bone and purulent secretion having been thoroughly removed an iodoform gauze packing was placed in the sphenoid and ethmoid regions, one end being brought out through the nose and the external wound closed by interrupted sutures. At the end of the second day the gauze drain was removed and the nose gently irrigated with a saturated solution of boric acid.

The patient made a quick recovery the eyeball gradually receding within the orbit and at the end of the ninth day he was discharged from the hospital.

Otto M. Ross

Thelsson, C. F. The Treatment of Maxillary Sinus Disease. *Albany M. J.* 9:6 1910 364

The author discusses only suppurative conditions of the antrum. For the ordinary cases of acute infection he advises that a cotton tampon soaked with equal parts of a weak cocaine and adrenalin solution, be placed under the anterior end of the middle turbinate with another between it and the septum. These should be left in place for from ten to fifteen minutes. The patient is given a spray solution containing adrenalin.

If relief is not obtained in forty-eight hours the antrum is punctured with Coakley's modification of Miles' trocar and irrigated with a mild solution.

For the subacute cases a simple intranasal opening is advocated while for the chronic infections the Caldwell-Luc or the Denker method is advised. If the frontal sinuses, ethmoids or teeth are contributory factors, they should receive appropriate treatment.

Otto M. Ross

Johnston, W. H.: Acidosis; Its Importance in Nose and Throat Surgery in Children. *Laryngoscope* 9:6 1913 1093

The author gives a résumé of the recent work on the subject of acidosis.

Acidosis does not mean the mere presence of acetone bodies in the urine. Acidosis exists when so

much bicarbonate is lost from the blood that the administration of a certain amount of bicarbonate fails to diminish the urinary acidity.

To detect any tendency to this condition the following tests are advocated:

1. The urine is examined and the finding of abnormal acids shows that there is a disturbance of ordinary metabolism but fatal acidosis may occur when no abnormal acids are found in the urine.

2. Evidence of unusual activity in the body's defense should be sought for by determining the amount of ammonia and its relation to the total nitrogen output. In the acidosis due to the inorganic substances as when the excretion of acid phosphates is interfered with there is no increase in the ammonia. A high ammonia coefficient should always make one suspicious of acidosis and further test should be made.

3. The alveolar carbon dioxide tension is diminished in acidosis because there is a decrease in the carbonic acid in the blood part of it being used to neutralize the excess of the tissue. There is a deviation from the normal reaction of the blood and an accumulation of carbon dioxide. This gives rise to the dyspnea and air hunger.

4. The blood plasma is tested for its bicarbonate content roughly by estimating the amount of bicarbonate which must be given in order to bring about a change in the reaction of the urine. This is spoken of as the tolerance for alkalis.

5. Testing the reaction of the blood by the use of some indicator.

The frequency with which this condition occurs after tonsil and adenoid operations is mentioned but no explanation offered unless it is that there is a prolonged starvation period because of the sore throat.

Preventive measures recommended are:

1. Examination of the urine and making a blood test before operation.

The patient should not be starved.

3. Sodium bicarbonate should be administered 5 grains three times daily for two or three days previous to operation and a solution containing 45 grains administered per rectum once-half hour before operation.

4. Excessive muscular activity, excessive emotional excitement, surgical shock and the use of an excessive amount of anæsthetic should be prevented.

5. A vegetable diet should be adhered to for a few days prior to the operation.

6. Morphine should be used before the anæsthetic but not during it.

As to treatment the intestines should be emptied by a warm enema of magnesium sulphate, glycerine, and water. This to be followed by colonic irrigation with a 5 per cent solution of sodium bicarbonate which may be repeated several times and may also be given intravenously or subcutaneously.

Otto M. Ross

Dabney V: Extensive Cholesteatoma Following the Luc-Caldwell and Killian Operations Simulating Sarcoma. *Tr Am Laryngol Ass* Washington 1916 May

The author reports the case of a man forty two years of age who gave no subjective symptoms of his grave condition other than nasal stoppage. Exophthalmos was marked deviation of septum complete polyps in the middle strait. On account of acute exacerbation three days later the Luc Caldwell operation was performed and extensive exceration of ethmoid bone with subsidence of symptoms. Five days after this symptoms returned and the Killian operation was done with perfect functional and cosmetic results. Eleven days later an abscess formed in the cheek and was evacuated by incision below and parallel to the lower eyelid. There was great distention of the cheek frequent spontaneous hemorrhages convincing radiographs and wooden-like hardness of the mass in the cheek suggested sarcoma. Two months later operation revealed an immense collection of true cholesteatoma. The odor was overpowering all the bone above below and on each side of the mass was eroded and totally destroyed including the floor and inner wall of the orbit two-thirds of the malar bone and all of the outer wall of the antrum. The present condition of the patient shows marked asthenia death is only a matter of a short time. Syphilis tuberculous malignancy were all excluded. Otto M Rott

THROAT

Theisen C. F.: An Epidemic of a Severe Form of Acute Infection of the Throat, with Abscess Formation Report of Fifty eight Operations. *Tr Am Laryngol Ass* Washington 1916 May

Of 384 cases coming under the author's personal observation 58 developed abscesses in different parts of the fauces. Of this number 44 were more or less typical cases of peritonsillar abscess. Of the remaining 14 cases abscesses developed in 8 in the lateral columns of the pharynx. There were 2 cases of infection of the epiglottis with great edema and some pus 2 cases of abscess of the lingual tonsil and 2 of retropharyngeal abscess. Joint complications acute rhinitis and polyarthritis occurred in 12 cases acute endocarditis in 1 and in 24 examination of the urine showed the presence of albumin and casts. In 68 cases acute otitis media requiring incision of the tympanic membrane developed with one mastoid complication in which the membrana tympani ruptured ten days before the author was called.

Cultures taken during the epidemic showed streptococcus infections in the majority of the cases. A few were pneumococcus infections.

Otto M Rott

Iglauer S.: A Simple Method of Fixation of Intubation Tubes. *La laryngoscope* 1916 xvi, 1089

The method devised by the author is a modification of Rogers technique and is especially adapted for

cases of laryngeal stenosis which in the course of treatment have required a tracheotomy. It may also be used in the intubated patient by cutting down through a few tracheal rings onto the intubation tube.

The technique is as follows. A shallow groove is filed around an ordinary hard rubber intubation tube just below the swell of the tube. Into this groove a silk thread about ten inches long is firmly tied with the knot on the anterior face of the tube. The ends of the thread are tied together and the thread and groove are saturated with melted paraffin to remove all sharp edges. Intubation is then performed in the usual manner. After intubation the silk thread is picked up with a slender forceps (or a crochet needle) and drawn out through the tracheal fistula. The thread is drawn fairly taut and fastened to the skin with adhesive plaster.

Otto M Rott

Roost F.: Endoscopic Surgery of the Oesophagus and Respiratory Tract. *J Larynx* 1916 xxvi 445

The author gives a résumé of the conditions for which endoscopy is of value naming the following

- 1 Foreign bodies inhaled and swallowed
- 2 Laryngeal tuberculosis
- 3 Diseases of the larynx malignant and non malignant
- 4 Stenosis of the larynx of the trachea.
- 5 Diseases of the oesophagus stenotic and non stenotic
- 6 As an aid to the internist in making a general diagnosis.

Otto M Rott

Auverda J. C. M.: The Tonsils. *Med Times* 1916 xlv 342

Several diagnostic points of importance are mentioned by the author. In the first place before deciding that a normal appearing tonsil is not diseased the author mentions the simple expedient of making pressure backward and outward on the anterior pillar and thus frequently a considerable amount of cheesy material previously unrecognized can be expressed. Secondly by pulling forward and outward the anterior pillar the anterior fossa can be exposed. Thirdly the author mentions the importance of the cervical lymphatics as an aid to diagnosis. He describes the course of the lymphatics from the tonsil to the superior deep cervical nodes under the anterior border of the sternomastoid muscle and states that they receive their afferents from (1) the tonsil (2) base of the tongue (3) from the submaxillary and submental nodes.

In contradistinction to this anterior group are mentioned the posterior group which lie deep under the sternomastoid or along its posterior border.

Enlargement of these latter are not indicative of tonsillar disease as they receive their afferents from (1) the superficial nodes in the suboccipital and mastoid regions (2) from the retropharyngeal glands (3) from the mucosa of the pharynx and nasopharynx.

and nasal mucosa posteriorly including that of the sinuses.

The author closes with a description of the well known Slender technique which he prefers to the snare operation for the following reasons:

- 1 It completely enucleates the tonsil
- 2 It takes less time.
- 3 The patient receives less anesthetic
- 4 There is less traumatism
- 5 A larger percentage of tonsils can be removed without dissection.

OTTO M. R. R.

French T. R. The Tonsilloscope and the Exploration of the Interior of the Tonsils in Situ
Tr. Am. Laryngol. Soc. Washington, 1906

The author has devised a method by which the external tonsilloscope originally intended and used for the examination of exploratory sections removed from the tonsil at the beginning of operations and now used for study of the tonsil as a whole or in part after operations may be used for direct tonsilloscopy or for the examination of the tonsil *in situ*. The introduction of the instrument into the throat is accomplished by using the shortest of the Jackson bronchoscopes with a beveled end and a lamp on a light carrier of the next largest tube packed securely with gauze so that the lamp is held just within the distal opening and the end of the tube slipped behind the tonsil. In this way the tonsil is lighted up as brilliantly as in the powerful external apparatus. With this instrument the author has studied the various classes of tonsillar disease including 333 cases that were operated upon and a large but indefinite number of youths and adults. He concludes that while this may not permit of definite and final deductions nevertheless the results seem to indicate that the erstwhile enlarged tonsils of health in childhood may be regarded as permanently diseased if they continue enlarged after the seventh or eighth year and that the enlarged tonsils of health which undergo a retrograde metamorphosis in late childhood may remain the tonsils of health.

The assumption that the tonsil has no special function because it has not yet been discovered is an unconscious confession of impotence to which few could agree but one conclusion reached in this study is that the function of the tonsil is a negligible feature, for it must be conceded that a tonsil which is extensively diseased would probably be the potential or actual source of too much mischief to be offset by the value of any function which a part of it might possess. When however a tonsil is found to be normal it should be left at least in part to perform whatever function it may have and also incidentally to spare the fauces the now common postoperative deformities and the consequent impairment of the speaking and singing voice.

OTTO M. R. R.

MacWhinnie, A. M. Tonsillectomy *J. Ophth. & Oto-Laryngol.* 1906, 2, 45.

Fulguration is the method described by the author for eradicating tonsillar tissue. He claims that there

is complete disappearance of all tonsil tissue in four to eight applications, except in cases of tonsils which partake of the fibrous nature. The method employed is to fulgurate around the tonsil anterior to the palatoglossus posterior to the palatopharyngeus, and internal to the so-called capsule once a week for four weeks. In exceptional cases eight applications are necessary. A light application of cocaine precedes the fulguration in patients who are sensitive.

The advantages claimed for this procedure are that it is safe there is no loss of blood there is no scar tissue it may be stopped anywhere short of complete eradication there is no interruption to the patient's vocation.

OTTO M. R. R.

Richardson C. W. Abscess of the Lung Following Operation on the Tonsils and Upper Air Tract.
Laryngol. Soc. 1906, 2, 100.

The report of nine cases of lung abscess following tonsillectomy in the medical ward of one hospital within a year should emphasize the fact that tonsillectomy is not the simple surgical procedure that the laity and many internists seem to consider it.

The cause of pulmonary abscess secondary to tonsillectomy is probably through embolism or infection of the lung. Many veins are opened at operation in the presence of septic material or infected blood, or pieces of tonsillar tissue may be aspirated.

The author reports three cases in which he performed tonsillectomy in adults where pulmonary abscess developed ten days after operation.

ELMER J. PETERSON

Lynch R. C. A Résumé of My Year's Work with Suspension Laryngoscopy *J. Am. Laryngol. Soc.* Washington, 1906, 2, 17.

To prevent fracture of the alveolus the author places a strap under the occiput and clamps it into the angles of the pear-shaped ring thus relieving the pressure of the tooth-plates against the teeth. In order to prevent other tooth injuries, he uses dental impression spoons filled with moulding compound which offers complete protection to the teeth facilitates the introduction of the spatula, and makes it easier to keep the spatula in the middle line.

The table which is described, can be raised twenty inches the top can be tilted and can be moved in a circle. There are foot and shoulder braces.

Regarding intrinsic epithelioma of the larynx the author's experience has been exceptionally good with endolaryngeal removal but he feels that his experience is not large enough to reach definite conclusions.

Dissection under suspension is not difficult and can be done without permitting an instrument to touch the tumor mass.

Nineteen cases of papilloma have been successfully operated dissecting well below the base cauterizing and painting with alcohol.

Pedunculated fibroma vocal nodules a cyst of the

aryteno-epiglottic fold pachydermic laryngitis perichondritis of the thyroid fracture of the thyroid cartilage tubercular laryngitis abscess of the epiglottis and foreign bodies in the trachea and oesophagus were all cared for by means of the suspension apparatus

Orro M Rort

Roy D Epithelioma of Posterior Pharyngeal Wall Cured with the Electrocautery *Tr Am Laryngol Ass* Washington 1916 May

The author's case a female aged 27 years was first seen July 29 1913 Her previous and family history were negative For three months she had suffered with a soreness and throbbing in her throat She had been treated continuously without result Examination showed a rounded ulcer on the posterior pharyngeal wall at the center one half of which was hidden by the soft palate. It was dirty grayish in appearance with edges sharply defined about one half inch in diameter and extending as deep as the superficial aponeurosis A piece excised showed it to be an epithelioma.

Removal was effected by means of the electrocautery point well outside of its edges No reaction and no discomfort followed Healing was perfect under one application After three years there are no signs of a return

Unfortunately clinical observers are too prone to classify all malignant growths of the throat under the general term cancer without distinguishing between the different forms of carcinoma and sarcoma This statement is made because the author has found it almost impossible to correlate all cases recorded in that many of them were reported in the most unexpected places and not under the headings where one would expect to find them As Morell McKenle and others have pointed out the disease is often so extensive when first examined that it is impossible to determine its point of origin.

Textbooks are very vague in the discussion of this subject It has now been three years since the case here reported has been healed and there have been absolutely no signs of a recurrence The results obtained in one case especially of the cancerous type certainly do not justify any positive deduction but the author believes that the thorough and judicious use of the electrocautery offers the best chance for a good result

Orro M Rort

Bryant W S: The Clinical Possibilities of the Pharyngeal Pituitary an Account of the Clinical Relation of the Nasopharynx to the Hypophysis System *Med Rec* 1916 c 441

The author's intention in this paper is to show (1) that the hypophysis system may be affected clinically through that portion of the system lying in the nasopharynx the pharyngeal pituitary and (2) that the results of clinical treatments of the pharyngeal pituitary are similar to those obtained in like conditions by hypophysis medication

In order to illustrate these points he discusses (1) adenotomy in its relation to the pharyngeal

pituitary and the hypophysis system (2) certain postnasal treatments which influence the hypophysis system by way of the pharyngeal pituitary claiming that the results after adenotomy and chemical stimulation of the pharyngeal tonsil manifested by rapid growth and improved nutrition, by relief from anorexia and morbid somnolence by freeing the system of infection and local relief from pain, by the regulation of blood pressure of pulse of circulation and of temperature all speak for themselves as to the involvement of the cerebral pituitary in the renewed activity of the pharyngeal pituitary

Orro M Rort

MOUTH

Moorehead F B The Prevalence of Chronic Mouth Infections and Their Management *J Am M Ass* 1916 lxvii 845

The finding of evidence of chronic mouth lesions in 69 to 89 per cent of a group of 700 carefully analyzed cases is convincing evidence that regardless of the form of treatment employed the removal of infection is imperative in all cases.

In carefully selected cases, conservative measures should be employed both in the treatment of chronic abscess and chronic suppurative periodontitis though the involvement of the periodontal membrane is the crux in deciding between conservative and radical treatment.

Faulty root-canal technique the careless use of arsenic as a devitalizing agent, and irritating drugs used in the treatment of root-canals are strong predisposing factors of chronic alveolar abscess, and where root-canals have been treated the process of repair should be checked up by roentgenograms at frequent intervals. The roentgen ray is paramount both in diagnosis and in determining the extent of tissues lost.

ELLEN J PATTERSON

Braun A. Acute Infectious Processes in the Mouth and Throat *Internal J Surg* 1916 xxix, 554.

The author mentions as the commonest causes of throat infections the following (1) streptococcus (2) staphylococcus (3) pneumococcus (4) diphtheria bacillus (5) bacillus fusiformis (plant Vincent) (6) bacillus mucosus (7) bacterium coli (8) bacillus tetragenus

In spite of the different germs giving rise to the infection the same pathological process is produced by each the only difference being that usually one phenomenon is more prominent than the other depending upon the location and the infecting agent

The following classification is given of inflammatory processes in the throat depending upon the location and which symptom of inflammation is most prominent

1 Inflammations which occur chiefly in the mucosa, of which there are four types

(a) Erythematous type, in which congestion is the predominating symptom

(b) Catarrhal type in which there is exudation of serum, red cells, mucus, or white cells.

(c) Degenerative type in which there may be fatty or hyaline degeneration of the epithelial layer of the mucosa associated with erosion or ulceration.

(d) Fibrinous type in which the exudate serum coagulates, forming a membrane on the surface of the mucosa.

2. Inflammations which occur chiefly in the submucosa of which there are three types

(a) Edematous type in which exudation of serum into the submucous connective tissue is the predominating symptom.

(b) Plastic infiltrating type in which the exudation of white cells into the submucous connective tissue is the predominating symptom.

(c) Phlegmonous type in which there is death of the submucous connective tissue with exudates of white cells forming pus.

The author discusses in detail the phlegmonous inflammations (1) faucial peritonsillar abscess, (2) lingual peritonsillar abscess, (3) retropharyngeal abscess, (4) Ludwig's angina. Otto M. Rott

Myers, H. L. Oral Infection in Relation to Systemic Infections. *Med. Rev.* 1906, 11, 35

The author gives a résumé of the question discussing the mod. of origin of systemic condition from remote foci drawing attention to the fact that these foci are not merely places of entrance for bacteria but are places where conditions are favorable for them to acquire the properties which give them a wide range of affinities for various structures.

Otto M. Rott

Irons, E. L. Dental Infections and Systemic Diseases: Treatment and Results. *J. Am. M. A.* 1906, 17, 85

The recognition by the dental and medical professions of the important relation of alveolar abscess to systemic diseases, due largely to the perfecting of roentgenographic technique requires the readjust-

ment of practice and methods of diagnosis with more team work between dental surgeon and physician.

There seems to be no question that alveolar abscesses may be the source from which invading organisms pass into the circulation producing metastatic lesions, or they may be latent so far as any marked effect on the general health is concerned.

Nevertheless, they are potential sources of trouble and from both the medical and dental standpoint should be eliminated. Adequate surgical treatment carried out by the dentist yields the best results.

ELIAS J. PATTISON

Carmody, T. L. Harelip and Cleft Palate. *So. W. J.* 1906, 744.

If there is a complete cleft from lip to pharynx the author advises the following order of operations: (1) hard palate by forcing superior maxilla together and premaxilla into normal position before the end of the third month. (2) lip—second to sixth month. (3) soft palate—sixth to fifteenth month.

The technique advised by Brophy is preferred for hard palate work and that of Owen Smith for the harelip while Langenbeck's method is advocated for soft palate work. Otto M. Rott

Stout, P. S. Further Study of Tumors of the Uvula Considering Their Frequency, Malignancy and Recurrence. *Laryngoscope* 1906, 17, 75

The author presents case reports from the literature and gives the following summary of his study:

There were 9 cases of carcinoma of these reported. Of the 9 cases of epithelioma reported 3 recurred. Of 6 cases of papilloma there were 2 recurrences. There were other cases reported without any data. Of the fibroma there were but 2 cases reported with very incomplete data.

No mention was made in any case of treatment with radium. Once a case of carcinoma was treated with X-ray but the outcome is not known.

Otto M. Rott

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EDITORIAL ANNOUNCEMENT

During recent years no subject in medicine has engaged the attention of the abdominal surgeon more than that of gastric and duodenal ulcer. His controversy with the internist regarding the treatment of this condition has been instructive to both and has formed one of the mileposts marking the advance of medical science. It has been our desire to provide a synopsis of the extensive literature that has grown up around this theme—a literature at once rich and creative. It is therefore a pleasure to announce that a critical review of the material dealing with ulceration of the stomach and duodenum has been prepared by DR. ROBERT C. COFFEY of Portland, Oregon. Doctor Coffey's wide experience makes it possible for him to cover this subject authoritatively, bringing to bear the critical comment of the unprejudiced mind.

Doctor Coffey has dealt first with the etiological factors in ulceration, offering a concrete resume of the various theories pertaining thereto. He then takes up their anatomical distribution and their pathology, features now fairly well established. Symptomatology and differential diagnosis are considered in turn with exhaustive reference to the literature. It is when the treatment of ulceration is approached, however, that the surgical phase of the question comes into predominance. The very extensive mass of material relating to the surgical treatment of ulcer of the alimentary tract creates a difficult situation in the effort to reduce it all to comprehensive formulation. Thus the author accomplishes ably and briefly. Finally a consideration of the technical procedures is presented. This critique, a brief for the entire subject enriched by competent editorial opinion, will be presented in the March number of the INTERNATIONAL ABSTRACT OF SURGERY.

INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY 1917

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Graham, E. E.: The Use of Salt Solution by the Bowel (Murphy Method) in Infants and Children. *Arch Pediat* 1916 xciii 775

The author regards the infusion of normal saline into the bowel by the drop method as a most valuable aid in the treatment of all the exhausting diseases of infancy and childhood, and believes that by its stimulating effects threatened collapse can often be averted. In feeding children and infants who cannot retain nourishment given by mouth a nutrient enema given drop by drop is often better retained and absorbed than when given more rapidly.

The length of time proctoclysis should be continued varies with the aspects of the case. In children especially it depends upon how they tolerate the presence of the tube within the rectum. In infants the mere fastening of the tube to the buttocks with adhesive strips will suffice but older children must be persuaded to allow the tube to remain, for it may be so annoying that a sick child will try to pull it out.

The usual duration of this treatment is from four to six days but if the rectum is not unduly irritated and the indications warrant proctoclysis may be kept up with interruptions for ten days to two weeks.

The author reports the case of an infant 25 days old who had severe jaundice and frequent vomiting. It weighed at birth 9 pounds but when seen by the author weighed 7 pounds and 14 ounces with diaper on. The stool consisted almost entirely of dark mucus. At times the head was retracted and the spine arched. The child was dull drowsy, and appeared to be very ill. It was placed on salt solution and in one week appeared much better

had gained 4 ounces. At the end of a month it had gained 1 pound. From then on it improved steadily.

EDWARD L. CORNELL.

Hill R. Posture in Abdominal Drainage. *Tr West Surg Ass* St. Paul, 1916 Dec.

There are three recognized positions in treating these cases (1) the Fowler as advocated by Fowler and later by Murphy (2) the prone position and (3) the lateral position.

1. The Fowler position tends to throw a decided strain upon a patient with an already weakened heart and lowered blood pressure. Moreover as the pelvis is lower than the pubic bones, drainage takes place by syphonage.

2. The prone position as used quite extensively in the St. Louis City Hospital is carried out by placing the patient on the abdomen with the head of the bed elevated 10 or 12 inches. A pillow is placed under the lower part of the chest, and one under the head so as to give ample room for breathing.

The principal objection to this position is that it is not comfortable but observations show that it is not so uncomfortable as one would suppose.

By this position the maximum effects of gravity intra abdominal pressure and capillary attraction are secured. In addition to this there are no spaces in the front of the abdomen to favor the formation of pockets, as there are in the pelvis and along the side of the spine. Pus is also brought against an area of the abdomen where blood vessels and lymphatics are not so numerous as they are in the pelvis. This is considered a very important fact, as it would seem that absorption would take place more slowly than in any other part of the abdomen.

3. The lateral position, in which the patient is placed on the right side in a slightly elevated position has been proved most efficient.

In the 104 drainage appendix cases operated upon at the St. Louis City Hospital in the past few months, the three positions were employed with sufficient frequency to warrant the following conclusions as to the relative merits of each:

1. In the 15 cases treated in the lateral position there were no deaths.

2. In the series of 48 cases treated in the prone position there were but 2 deaths.

3. Of the 47 cases treated in the Fowler position there were 3 deaths. All cases received the same after-treatment which is considered to be an important factor.

The author's opinion from his experience both in private and public institutions is that the posture in which a patient is placed contributes materially to his recovery, and he also believes that the prone and lateral positions are much superior to the Fowler.

ASEPTIC AND ANTISEPTIC SURGERY

Delbet P: New Study on the Action of Hypochlorites (*Une nouvelle étude sur l'action des hypochlorites*). *Bull et mem Soc d'hir d'Par* 9 6 xlii, 977.

Delbet's previous studies on the action of Dakin's fluid gave him the indications in cases of wounds already infected only that is in which microbes were already colonized. The present studies have been undertaken to determine how hypochlorites act in the case of fresh wounds and whether they are capable of preventing the development of microbes. He has been enabled to make his studies in the ambulance service conducted by Delanglade.

Of 22 wounds which Delbet examined in the first few hours after injury in only 3 could he find any microbes in the beginning and such wounds were caused by shell or grenade. Only 11 of these wounded could be followed. All these were treated by complete resection of the edges and walls of the wound followed by intermittent irrigation with Dakin's fluid.

In spite of the very favorable circumstances and the fact that in 9 of these cases no microbes were revealed before treatment only 2 of these remained aseptic, and one of these not absolutely so as there was one positive pyoculture.

The evolution of the hypochlorite treatment is noted. At first it was only a modification of Labarraque's fluid which rendered it less irritating by taking from it a part of its antiseptic power. In this first phase of its use it was considered by Carrel, Dakin, and others that this fluid alone was capable of sterilizing wounds. There was then no thought of opening up the wound. In the second period the necessity of early and large openings was shown, which was to a great extent an avowal of the failure of hypochlorite action alone. Finally the practice of resection was adopted, the whole trajectory of the wound being resected under anesthetic.

In all these changes the hypochlorite remained constant the change being in the surgical treatment accompanying its use. The more favorable results now obtained therefore cannot be ascribed to the constant but to the variable.

Delbet points out that a number of surgeons are at present treating their wounds by mechanical surgical clearing of the area, resection, and immediate reunion.

W. A. BAXMAN

ANÆSTHETIC

Flagg, P. J. Anæsthesia. *N Y M J* 9 6 civ 417.

In order to facilitate the teaching of the art of anæsthesia, the author offers a classification which combines the findings of the physiological laboratory and the operating room. There are three primary divisions: general, local, and spinal anæsthesia. There are two degrees of general anæsthesia: complete and incomplete; a complete general anæsthesia consisting of three stages: (1) induction, (2) maintenance, (3) relaxation.

The first stage consists of three periods: excitement, rigidity, and relaxation; the second may be of two varieties, constant and variable maintenance; while the stage of recovery is divided into two periods, return of the reflexes and return of consciousness. Two types of recovery are seen, recovery by crisis and recovery by lysis.

When such a classification is employed, the signs of anæsthesia may be definitely charted. The behavior of the pupil under ether during the stage of induction, maintenance, and recovery may be spoken of with the assurance that the time specified will not be misunderstood, while muscular relaxation becomes a test of the worth and efficiency of the general anæsthetic.

E. K. ARMSTRONG

Andersson H. C. Anæsthesia by Selection. *J M St M* 121: 9 6 xlii, 477.

In addition to the usual requirements of any anæsthetic, the following factors should be taken into account:

The wishes of the operator as to the depth of the anæsthesia.

2. The history and condition of the patient especially as far as heart lesions are concerned, mitral stenosis, and aortic insufficiency being bad risks. The anæsthetist's responsibility does not cease with the termination of the anæsthesia, the most important factor being the amount of anæsthesia which is in the patient's system at the time he leaves the operating room. No operation requires any greater skill than the administration of an anæsthetic for a radical tonsil and adenoid operation, the latter being a major operation as far as the patient is concerned. The use of morphine and atropine greatly aids a general anæsthesia if properly timed. If ill-timed it will invite trouble. It is best given one-half hour before general anæsthesia, but it should not be used in every case nor should

the dose be the same. Those who have pain should be given morphine, as well as those who have no pain and a normal or dilated pupil. If no pre-operative pain is present and the pupils are contracted, morphine should be withheld.

3 The duration of the operation must be determined and the anæsthetic chosen which will be the least harmful. If chloroform is used as a preliminary to ether it is safe if a slight Trendelenburg position is maintained.

4 Freedom of choice should be left to the anæsthetist. While ether by the drop method is the safest of all anæsthetics, it is the most uncomfortable of inductions. Though drop ether is practically imperative in long operations it should be preceded by some more comfortable method of anæsthesia.

Nitrous oxide oxygen is the method of choice for induction being many times less dangerous than chloroform and ethyl chloride. In gas oxygen there is a safe and efficient substitute for twilight sleep and a valuable addition to the anæsthetist's armamentarium but not as innocuous as would be expected. Very even anæsthesia is essential to prevent trouble, even in minor operations. The simpler the machine for its administration the better while after the first stages have passed air is better than oxygen.

The use of local infiltration with novocaine is of value in lessening the responsibility of the anæsthetist, as a general anæsthesia can thus be maintained in a very superficial stage throughout a long operation. Intraparapharyngeal anæsthesia is of the utmost value in the plethoric thick necked patient who is laboring for air who is cyanotic and who has large amounts of bronchial secretion to prevent the proper absorption of ether vapor. The introduction of a hard rubber tube into the pharynx produces a startling change, the cyanosis disappearing and the anæsthetic progressing in an uneventful manner.

E. K. ARMSTRONG

Gulsex: General Anæsthesia by Direct Intubation in Operations upon the Head and Neck (*De l'anesthésie générale par l'intubation directe dans les opérations sur la tête et sur le cou*) *Bull Acad de Méd* Par 1916 lxxvi, 245

The new method of anæsthesia proposed by Gulsex depends on the fact that it is possible by means of a special sound introduced through the mouth and with the aid of direct laryngoscopy to administer directly into the trachea a very exactly proportioned mixture of air and chloroform.

This procedure is quite different from the method of anæsthesia by insufflation employed in the United States, in which the anæsthetic mixture is insufflated into the bronchi by means of a special apparatus, expiration being made through the free space between the sound and the broncho-laryngeal wall. In Gulsex's method inspiration and expiration are done directly through the sound.

Preliminary narcosis is induced by the mask in

the ordinary way. When this is complete the head is placed in extension and the tube introduced until by the aid of the laryngoscope it is seen that the trachea has been reached. Anæsthesia is then easily continued without interruption until the end of the operation.

The advantages claimed by the author for the method are (1) The chloroform generator is removed from the operative field. (2) There is considerable curtailment of time of operations on the mouth and pharynx. In such operations it is now customary to periodically administer the chloroform and to suspend operation during these periods. (3) It is no longer necessary to pay attention to what American authors have termed the death space. There is no doubt that the majority of deaths from anæsthesia are directly or indirectly due to the purely mechanical obstruction of the region comprised between the mouth and the larynx. (4) All danger of vomiting in the trachea or of aspiration of blood in the air passages is obviated. The author does not admit any disadvantages.

W. A. BRENNAN

Johnson, W. M.: Rectal Anæsthesia. *N F M J* 1916 clv 846

The dose of ether for rectal anæsthesia depends upon the age and weight of the patient about one ounce of ether being required for each twenty five pounds of body weight. This may be lessened when paraldehyde is used. More than 6 ounces of a 75 per cent oil-ether mixture should not be given to adults, regardless of weight. The ocular reflexes should never be abolished and stertorous breathing should not be allowed to continue. These are danger signals, indicating the withdrawal of one to two ounces of fluid from the bowel. At the completion of the operation the colon should be irrigated.

Postoperative nausea seems to be less, fright and shock are much less, and the method is safe and easy of administration. It is indicated especially in operations on the head, neck, throat or chest in the obese alcoholic, and in the aged because of lessened bronchial irritation. It is contra indicated in any disease of the intestines, pelvic operations, and in general laparotomies because of gaseous distention.

E. K. ARMSTRONG.

Cole, H. P.: Some Observations on Local Anæsthesia. *Tr South Surg & Gynec Ass* White Sulphur Springs, 1916 Dec.

The author reports a partial list of major operations performed under local anæsthesia, many of which were selected because of grave contra indications to general anæsthesia.

The list includes 25 cases of appendectomy for acute and chronic conditions, drainage of peritoneal abscesses and general peritonitis. There were a number of exploratory operations, enterostomies and gastro-enterostomies. 8 cases of cholecystotomy, one removal of a forty-three pound ovarian cyst, one nephrectomy and a number of thyroidectomies.

There was one case of suspension of the uterus and one removal of an ectopic gestation also 3 cases of radical amputation of the breast and 3 cases of decompression of the skull. There were 7 laparotomies performed under local anesthesia during pregnancy with no maternal mortality and with the loss of one fetus.

In the series 7 operations were performed on patients in the first decade of them being under two years of age—one case a 1-litre artificial anus for imperforate anus on the third day of life.

There were 47 cases operated on between the ages of fifty and eighty-seven almost exclusively selected for local anesthesia because of cardiovascular or renal contra-indications to general anesthesia. Among this group was an extensive operation for carcinoma of the sternum on a patient eighty-seven years of age exenteration of the orbit

for sarcoma in a patient eighty-one years of age amputation for gangrene of the foot in a patient seventy-one years of age cholecystotomy for ruptured gall bladder in a patient fifty-two years of age nephrectomy in a patient of fifty-two and a case fifty-two years of age in which cholecystotomy appendectomy and posterior gastro-enterostomy were performed through the same incision.

Among the cases operated on under local anesthesia between the fifth and ninth decade there was a mortality rate of 4 per cent.

There was one death among the seven major operations performed on infants in the first decade, with a 14 per cent mortality rate.

The author concludes that the selection of local anesthesia as the anesthetic of choice in cases offering grave mortality risks, is a factor of safety too potent to be neglected.

SURGERY OF THE HEAD AND NECK

HEAD

Fastani G M. Some Cases of Gunshot Wounds of the Head (*Sopra alcuni casi di ferite da arma d fuoco del capo*). *Gior d Acad d med d Turin* 9 6 lxxix 278.

Fastani has treated 51 gunshot head wounds in an advanced field hospital. Of these cases 43 entered within the first twenty-four hours after in jury 12 being in such a desperate condition that they died from the gravity of their injuries 4 did not call for intervention the other 26 were promptly operated upon in order to prevent infective complications. Within a few days 9 showed signs of infection and were operated upon the second time. All cranial injuries without dura involvement ran a regular course. Of 15 superficial wounds operated upon early there was only 1 death. Of 5 cases operated upon secondarily for infection, 4 died. Of 9 penetrating wounds with projectiles implanted in the brain and operated upon early there were 5 deaths. One case which was operated upon late died.

The results show the advantage of early intervention. This is the essential factor of success in all such wounds. Rapid transit to an advanced surgical posts for treatment of head injuries will be the most efficacious means of checking the mortality from such injuries. Vetter who operated in from two to six hours after injury was able to show 58 recoveries for 9 deaths in an automobile service. W A BRIDGMAN

Beck, J C. Present Status of Carcinoma with Special Reference to the Head and Neck. *Laryngoscope* 9 6 xxvi, 1 58.

The author has observed over 400 cases of cancer of the head and neck in the last twenty years and can see no advancement in diagnosis or treatment of

the disease. The microscope and surgery now as they were twenty years ago are our only means of combating the disease.

Buchanan, working in conjunction with the author has succeeded in growing an organism from carcinomata removed at operation which has a characteristic color and appearance, which produces an epithelial tumor when injected into mice which die with metastases and rapid emaciation, whose blood gives positive Abderhalden reaction for cancer, the organism can be recovered from these mice and others re-inoculated. Other tests are equally convincing but the author makes no claim that this organism is the causative factor of cancer.

In regard to diagnosis the microscopical examination of excised tissue is the only positive method. The Abderhalden test has been performed in about one hundred cases and found positive in 7 per cent. A complement-fixation test has been worked out by Kobalter which is analogous to the Wassermann test for syphilis and gives a higher percent of positive reactions than the Abderhalden. The Davis hæmo-urochrome test of the urine has given a positive reaction in the urine in 60 per cent of more than 300 cases. Clinical diagnosis is still the most important and the author warns against losing too much time waiting for therapeutic tests to differentiate carcinoma from syphilis, or for the use of the X ray or radium to effect a cure.

Radical surgery is the only rational treatment of carcinoma. To guard against implantation recurrences, the author uses the actual canterly instead of the knife for excision of the growth. He has applied the Percy coagulation method with great satisfaction after devising special specula for the nasal oral and pharyngeal cavities.

In very superficial lesions radium has been employed with good results. Ten milligrams of radium element has been the dose available. The

X-ray is of even greater value in these superficial tumors and the author prescribes at least one erythema dose before, and five or six after each operation. Diathermy has given striking results in causing the disappearance of true epithelial growths which in the author's experience have inevitably recurred.

Beck pleads that a committee be appointed by a recognized cancer society to examine and report on the results of every new cure or aid in the treatment of carcinoma which is advocated or discovered by a reputable physician. E. FISCHER.

Soler C. B.: Ten Cases of Cancer of the Tongue and of the Floor of the Mouth (Acercos de diez casos de cancer de la lengua y suelo de boca) *Odonologia Madrid* 1916 xxv 330

Soler reports these cases to illustrate the operative technique followed by Trigueros of Madrid.

The procedures in vogue, buccal and extrabuccal of Whitehead and others for the partial or total extirpation of the tongue for cancer are insufficient since the involved lymph glands are not dealt with nor is the diseased floor of the mouth extirpated. Total removal of the tongue is not necessary according to the author and is a brutal procedure.

Trigueros uses the suprahyoid route making his incision over a line which runs from the middle part of the ascending branch of the lower maxillary and follows the edge of the sternocleidomastoid and thence horizontally to the level of the hyoid forming an angle tangential to the hyoid cartilage. This incision gives ample facilities for removal of such glands as are necessary as well as the affected parts of the tongue and floor of the mouth. Details of the technique are described.

Chloroform anesthesia is employed and minute postoperative care is bestowed. Excellent results were obtained in all the 10 cases operated upon. Of these cases 9 were in males and 1 in a female which proportion roughly agrees with the statistics of others. Primary implantation of carcinoma in the floor of the mouth is rare. Wolfier found it only in 7 per cent of all cancers of the buccal cavity. In a collection of 37 cases the author found it in 21 per cent of cases of cancer of the tongue and mouth.

W. A. BRENNAN

Gallego, A.: Paradental Adenocarcinoma (Adeno carcinoma paradentario) *Odonologia Madrid*, 1916 xxv 505

Gallego reports the case of a woman of 35 who was operated upon for a tumor of the lower maxillary. Three years later there was recurrence and she was again operated upon. There was a second recurrence after four years more and then the tumor was provisionally diagnosed as an inferior maxillary sarcoma.

Detailed histological examination showed that the tumor was of epithelial nature with certain characteristics both of cylindroma and adamantoma. It differed from the first in that it did not show

either cubical or plain cells and especially in that its conjunctive tissue had not undergone mucoidal transformation. It differed from the second type in that its epithelial cells were cylindrical and there were no bulbous groupings of cells.

Such a neoplasm a primary tumor of the lower maxillary ought to have a paradental epithelial origin and hence the author classes it as an adenocarcinoma of the inferior maxillary.

W. A. BRENNAN

Kreuscher P. H.: Ankylosis of the Jaw *Internist* *1st J.* 1916 xxiii 857

Kreuscher reviews 23 cases from the clinic of the late Dr. John B. Murphy, giving the causes of the ankylosis (routes of invasion) the four types of jaw ankylosis, the seven stages in the evolution of the operation for ankylosis of joints in general diagnosis and the Murphy technique and its results.

The four types of jaw ankylosis are (1) intra-articular bony ankylosis—true ankylosis (2) intra-articular fibrous ankylosis (3) subzygomatic cleatrical fixations (4) interalveolar buccal fixations.

The seven stages in the evolution of the operative technique for ankylosis in general are

- 1 The formation of flail joints.
- 2 The restoration of motion in a bony ankylosed joint by the interposition of muscle and fibrous tissue between the separated ends of the joint.
- 3 Pseudo-arthritis developing after bone operations in the neighborhood of joints.
- 4 The transplantation of pedicled flaps of fascia, fat, and capsule with the production of movable sliding serous surface joints.
- 5 The homotransplantations of the articular ends and surfaces of the bone.
- 6 The transplantation of flaps of fat and fascia which have been detached.
- 7 The interposition of foreign material to make the joint.

The fourth is Murphy's method and has given practically 100 per cent movable joints in his work. It is applicable in nearly every joint of the body where the periarticular tissues have not been destroyed by previous operation of destructive pathological processes.

The four routes of invasion into and surrounding the temporomandibular articulation as described by Murphy are

- 1 The most frequent an extension of the suppurative from the middle ear.
- 2 An osteitis or osteomyelitis of the mandible extending into the glenoid cavity.
- 3 The metastases from foci of infection within the mouth or elsewhere in the body or part of the general metastatic arthritis.
- 4 Ankylosis may result from a transmitted trauma from the tip of the chin to the articulation giving a traumatic osseous fibrous arthritis.

Murphy's diagnostic points in osseous or firm fibrous union are

1 Flattening of the jaw on the unaffected side, most pronounced near the tip of the chin

2 When the patient attempts to open the mouth the teeth move from 1/60 to 1/600 of an inch downward and deviate a little in the direction of the ankylosed side.

3 A sliding motion on the unaffected side can be felt by the palpating finger and the muscular activity on that side is very much greater

4 The muscles on the ankylosed side are more atrophied than on the other side

5 The distance by measure 1 from the lower edge of the zygomatic rib to the lowest point on the ramus of the jaw is less on the affected side than on the well side.

A perpendicular incision is made just in front of the ear extending from one and one-half inches above the zygoma in the hair line downward to the lower border of the zygoma. This incision then curves forward on the superior margin of the zygoma to a distance of about three fourths of an inch and then curves upward slightly so as to avoid injuring the temporal and orbicular branches of the facial nerve. This is followed by removal of a section of bone one half inch wide clear across the neck of the mandible. Great care must be exercised not to injure the internal maxillary artery which closely hugs the neck of the mandible. Injury to the brain which is in close proximity must be avoided in this part of the operation. A U-shaped flap of fat and fascia about one inch wide and two inches long with the base at the upper margin of the zygoma, is reflected from over the temporal muscle and packed in to the bony gap left by the bone resection. The flap is retained in position by a few catgut sutures at its anterior and posterior basal angles. The skin wound is accurately closed with horse hair, dusted with bismuth subiodide, and sealed with collodion on gauze or cotton. A wooden wedge is inserted on the diseased side to maintain separation of the molar teeth to prevent necrosis or compression of the flap until it is healed. Any hematomata must be aspirated at its first evidence the aspiration being repeated if necessary

Th only failures were reoperated upon with good results. These failures Kreuscher says, were caused most likely from not keeping the wooden plug in proper position. The speculative reasons for failure following the first operation are (1) Possibly not all the periosteum was removed with the bone. (2) There may have been an absorption of the interposing flap with ossification of the newly formed connective tissue or the flap may have retracted leaving two bony surfaces to reunite

CARL R. STRUMER.

Hemachen, K. Subaponeurotic Covering of Large Skull Defects with Hochen Shells (Subaponeurotische Schädeldedeckung mit gewöhnlichen Hochen Schellen) *Beit. z. klin. Chir.* 19 6 xclx 550.

In large defects of the skull bone transplantation frequently produces unsatisfactory results, even in

cases where the primary result was perfect as the bone may later become absorbed and with it the periosteum. Therefore the author resorted to alloplastic transplantation in 6 cases of large resection defects at the surgical clinic of Professor Sauerbruch. After discussing the different methods he reports the two cases and the method employed. First a cast of the head was made and to this a plate of b. ital. horn was fitted to a thickness of 3 mm with slightly thinner edges. It was then sterilized by placing in absolute alcohol for three days as boiling would spoil the shape.

One case was of a girl of 9 with a spindle celled myelogenous osteosarcoma of the parietal bone which after removal left a defect of 7 to 8 cm. The piece of horn was inserted under local anesthesia and recovery was uneventful. One year and 9 months after the operation the patient was entirely well and had no recurrence. In the second case there was originally a dura angioma which made the skull bulge forward and nearly perforated it. A bony window the size of hand was removed and after the tumor was treated with injections of coagulum and carbon dioxide snow it disappeared entirely. The 7 by 5 cm defect was covered with a plate of horn and healed per primam.

Since horn has the ability to become encapsulated with connective tissue without producing any irritation and permits healing of the wound it is adaptable in many cases such as spinal fissures, replacing bony defects of the nose, defects of the lower jaw, spina for the spine according to Albee for closure of congenital left of the sternum, closure of chest wall defects, etc. L. A. JONES.

Leclerc, G. and Walsh. Osseous Graft Taken from the Scapula to Replace Cranial Loss. Ivory Plates in the Repair of Cranial Losses (Part de substitution du crâne oblitéré par un greffon osseux emprunté à l'omoplate d'un observateur de la clinique des plaques d'ivoire pour réparer des pertes de substance du crâne) *Bull. et Mem. Soc. de Chir. de P.* 9 6 xlx, 80.

The above reports were submitted by Maudsire. In Leclerc's case the loss of cranial substance was repaired by a cranioplasty made at the expense of a bone graft borrowed from the scapula. The hole was the size of 5 franc piece. In the cases reported by Walsh the holes were approximately 5 cm. by 4 cm. and were repaired by ivory plates.

Maudsire calls attention to the different methods of repairing cranial losses: periotic, osteoperiotic, and cutaneousperiosteal cranioplasty (1) a topiastic, homoplastic or heteroplastic osseous grafts (2) cartilaginous grafts (3) transplants of macerated, decalcified, carbonized calcined or sterilized bone (4) cranial prosthetics (5) finally in order to complete the repair fat, serous, and fibrous complementary grafts.

All these methods have given good results, the cartilaginous is the most generally employed now.

but time will show whether the cartilage becomes ossified.

Maudsire reviews the history of the various procedures and thinks that generally speaking osseous and cartilaginous grafts are preferable to prosthetic procedures with ivory metallic or other plates. As regards functional results the end aimed at by the surgeon is not the amelioration of encephalic disturbance, but the protection of the brain from injury. The psychic effect is good because the patient feels that his brain is protected. The esthetic result is equally satisfactory.

Reports submitted by Marie Claud and Sicard do not however show that in cases of repair of osseous breeches that there is any satisfactory cerebral functional amelioration. Thus in 21 cases of repair on which Marie has reported there were 6 ameliorations without complete disappearance of subjective disturbance, 12 absolutely stationary and 3 cases of aggravation of the subjective disturbances. Moreover Maudsire does not think it wise when there is a tendency to cerebral hernia to close the osseous breach. If there is hypertension of the cephalorachidian fluid it is best to defer repair.

W. A. BRENNAN

NECK

Simpson, C. A.: Roentgen Ray Treatment of Exophthalmic Goiter. *South M J* 916 ix 857

The technique employed by the author in treating cases of exophthalmic goiter by the roentgen ray consists of giving 5 points Hampson of ray filtered through 1 mm. of aluminum over the thyroid and thymus region every two weeks. The skin is protected from secondary rays by several layers of chamois skin. The Coolidge tube is used with its anode 8 5 inches from the skin.

Of 28 cases treated 5 failed to show any real improvement. The other 23 showed results which compared favorably with those obtained by surgery in similar cases. The changes noted were improvements in pulse, weight tremor sleeplessness general nervousness, strength and endurance. The exophthalmos and tumor often persisted. The author was unable to find any very marked blood changes following the treatments nor could he produce any such changes experimentally in rabbits even when the treatments were carried to the point where the thymus was destroyed.

The conclusions he arrived at are as follows:

- 1 That X raying the thyroid gland alone will sometimes relieve the symptoms of Graves disease.
- 2 That the blood count fluoroscopic, and X ray picture examinations are often misleading and should not have too much effect on prognosticating the favorable and unfavorable cases.
- 3 That a large percentage of cases of exophthalmic goiter are associated with enlarged thymus which many surgeons, to avoid dangerous post operative symptoms and even death advise resect

ing at the same time the thyroid is removed. This must greatly prolong and complicate the difficult operation of thyroidectomy in patients who have always been regarded as bad operative risks.

4 That the roentgen ray will quickly and painlessly atrophy the thymus gland and for this reason should be the method of choice in all cases of exophthalmic goiter where enlarged thymus are suspected.

ADOLPH HARTUNG

Aikins, W. H. B. The Etiology and Treatment of Exophthalmic Goiter with Special Reference to the Use of Radium. *Canad Pract & Rev* 1916 xli, 313

Whether one accepts the glandular theory or the neurogenic theory as the causative factor in exophthalmic goiter it is obvious that all therapy must be directed at a reduction in the increased vascularity of the thyroid gland. The first essential in successful treatment is the most complete bodily and mental rest which is obtainable under the circumstances. This alone in the mild cases will occasionally effect a cure. Other aids, such as proper nutrition, medicaments, glandular and scrotherapy, roentgen ray and hydrotherapy are briefly discussed. The author places the greatest reliance on the hydrobromate of quinine and ergotin in the medicinal treatment of the disease, and cites case histories of seven patients treated and cured by radium emanations over the thyroid gland, most of these cases were referred to him after the usual medicinal and other treatments had failed to effect improvement.

E. FISCHER.

Benjamin, A. E. Thyroid Disease and the Present Method of Operative Treatment. *Tr West Surg Ass* St Paul, 1916 Dec.

Of late there has been much study upon the thyroid to determine its true function, the character of the toxic substance which is responsible for the symptoms present in the diseased state and the influence of this substance upon the various tissues of the human body.

Much data has been secured to formulate some definite rule of procedure in the treatment of the diseased thyroid. All this study and data up to the present time indicate that operative treatment is most reliable and gives the most permanent results, also that the symptoms of thyroid disease must be recognized by the profession in general, earlier and the gland operated upon to prevent irreparable damage to the heart, liver and kidney nerves and muscle tissues of the body.

Ligation of the blood supply has been performed quite extensively in severe cases. In others a low collar incision with a rapid removal of portions of the gland and in less toxic cases either complete removal of the lobes or a resection with the removal of the center and the more diseased portion of the gland. The resection method with a normal amount of tissue left in the two lobes allowing the capsule of the posterior half of the gland and any healthy

glandular structure attached thereto to remain is now an accepted method of procedure. This plan has been followed by satisfactory results, a symmetrical neck and a moderate degree of scarring is thus obtained.

Bartlett W. Subtotal Thyroidectomy. *T. South Surg. & Gynec. Ass. White Sulphur Springs*, 9 Dec.

The author applies the term subtotal thyroidectomy to the symmetrical bilateral amputation of considerably more thyroid tissue than has been customarily removed in those cases where lobectomy has been employed in the past.

The patient if a woman assumes the upright position and puts on a chain or a string of beads indicating where she desires to wear the same, then their location is marked on the skin to locate the scar which they are to hide later. The patient's position on the operating table subserves the purposes of good exposure and diminished bleeding by the upper end of the table being elevated and the patient a head thrown back.

Where a general anesthetic is used ether vapor is

blown into the pharynx through a glass ∇ to which two nasal tubes are attached. After the upper pole of the goiter has been ligated, the lobe is isolated as much as possible and clamped clear across the base about the plane of the intended amputation. The resulting ∇ -shaped effect is sutured with catgut and thus much bleeding and labor are avoided. The ligating is done with fine catgut which is withdrawn as needed from a tubular glass receptacle, held in the operator's left hand. In this manner waiting and soiling of ligature material are prevented. The deep defect is drained by a split rubber tube which is laid transversely across the bottom of the large defect and carried out at the two ends of the incision. The skin is closed with exceedingly fine silk to which tiny non-cutting needles have been stamped. Immediately after the operation the patient is put to bed on her face to permit prompt escape of tracheal hypersecretion.

The author states that his results in toxic goiters have been uniformly ideal only since he has, by this technique, removed a sufficient amount of goiter tissue to the primary operation.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Horsley J. B. Cancer of Mammary Tissue Displaced in Axilla. *T. South Surg. & Gynec. Ass. White Sulphur Springs*, 9 Dec.

Horsley calls attention to the fact that primary malignant epithelial growths in the axilla are rare. The growths usually found are metastatic through the lymphatics. He reports a case in an unmarried woman, 46 years of age, who had two sisters with cancer. This patient noticed a growth in the right axilla which became quite painful. There was no evidence of any primary lesion elsewhere. A block dissection of the axilla was made. An examination of the tissue removed showed it to be malignant, and, after pathological examination, Dr. Bloodgood reported that it was cancer of the mammary tissue. The symptoms of pain which are unusual in early cancer were probably due to pressure on the intercostohumeral nerve. The pain seemed to become worse about every three or four weeks. The presence of early pain and of increased pain during menstruation were probably significant symptoms. Three years and four months after the operation the patient was examined and found to be entirely free from recurrence.

Roffo, A. H. Carcinoma of the Male Breast (Carcinoma de la mama en el hombre). *Presencia Med. Argent.*, 9 Dec. 1911, 211.

This is the second case of carcinoma of the male breast reported by Roffo and makes the third case in the Argentine literature. The patient was a

man of 60. The disease began about 10 years previous with intense pain in the mammary region which later showed tumor formation especially about the left nipple. The inflammation disappeared under local treatment and gave no further trouble until three years ago when acute inflammatory phenomena of the same character as before but more intense reappeared. Examination showed a hard lobulated neoplasm in the left breast. About the nipple there was a vast irregular hard ulceration with reddish vegetating patches in which small purulent zones were noted. The neoplasm had invaded the subcutaneous cellular tissue and part of the pectoral muscle; the axillary ganglions were much augmented.

The patient died without operation, and histological examination the findings of which are shown in great detail and fully illustrated showed the tumor to be an extensive carcinoma of the tubular type. W. A. B. KRAMER

Rischbieth H. Notes on a Case of Carcinoma of the Male Breast. *Med. J. Austral.* 10 Dec. 1911.

A case of that rare condition, carcinoma of the male breast with removal, is reported. The tumor was of two years' duration and had been operated upon a year before. At the second operation the pectoral fascia, the superficial fibers of the pectoralis major and the serratus magnus, together with a layer of fat was dissected away as far as the axillary vein. There was no removal of the fascia or glands on the deep surface of the pectoralis major nor of the bulk of the muscle itself. Less

than six months later there were recurrences in the skin adjacent to the cicatrix and in the glands of the axilla. A third operation was done, at which time the whole of the pectoralis major and the fibrotic contents of the axilla were removed.

The rule is that cancer of the male breast must be treated just as in the female. The fact that they are often small should not justify limited removal. The first operation done by the author in this case is the one advocated by Shield but in view of the recurrence, seems not to have been sufficiently radical. Cancer of the male breast is often regarded as of relatively low malignancy an erroneous belief in many instances. In the case cited the early age incidence, 33 years the local recurrence and glandular involvement within ten months all speak for a high grade of malignancy. There seems to be no reason to believe that cancer in the male breast is in any way different from that in the female breast and the operative procedures should be the same, regardless of the desire to avoid impairment of the function of the arm.

Murphy in 1914 advised the radical removal of the entire breast and while Poirier concludes that the scirrhous carcinoma most commonly seen in the male breast is comparatively inactive yet from the difficulty in distinguishing between those of varying malignancy at the time when the prospects of radical cure are greatest the teaching of Murphy is the only one to follow. E. K. ARMSTRONG

Leslie R. M. Injuries of the Chest During War
N. I. J. 1916 IV 625

The subject is discussed from a medical rather than a surgical standpoint. As seen in base hospitals the great majority of chest injuries are due to gunshot or shrapnel wounds other injuries such as bayonet wounds or crushing injuries due to mine or shell explosions being usually rapidly fatal are seen only at the front. At the rear the proportion of chest cases is from 6 to 8 per cent. They are classed as (1) non penetrating and (2) penetrating according to whether or not the missile enters the thoracic cavity.

1. Non penetrating wounds present no special problems. They may or may not be attended with shock according to the extent of injury to the ribs or to the vertebral column. The lung may be contused by the impact of the ribs sufficiently to cause hemoptysis or hemothorax. The spinal concussion may lead to functional or more rarely to organic paraplegia usually following crushing injuries.

2. In penetrating wounds the effects depend upon (1) the direction and site of the bullet track. (2) the presence of septic material within the thoracic cavity.

Longitudinal wounds—the patient being wounded when lying down—and those of the central zone endangering the heart great vessels and larger bronchi are much more serious than transverse wounds especially those of the peripheral zone.

According to its direction the bullet may penetrate the thorax and lodge in some other part or cavity as the arm or abdomen.

Shrapnel bullet and shell fragments are more likely to carry septic material from the skin or clothing than rifle bullets. Hemothorax occurs in 75 per cent of the penetrating wounds. The source of the blood may be chiefly from the chest wall even when the lung is penetrated. The symptoms are hemoptysis and dyspnea for the first two or three days then becoming milder with only a slight rise in temperature. The signs may be confusing owing to emphysematous expansion of the upper lobe of the lung. If sepsis is present (pyohemothorax) the constitutional signs are much more pronounced increasing dyspnea local pain and friction sounds. Exploration is advisable in all cases not improving by the fourth day. Early aspirations may be sterile as the bacteria are at first contained in the blood-clots only. Since death from hemorrhage does not occur after the third day removal after the fourth day to a base hospital is highly desirable where the facilities for treating complications may be had. If aspiration is performed in aseptic cases the remote effects of dyspnea on exertion and fixation of the chest wall due to lung collapse are rendered less probable. The mortality as a whole is about 10 per cent due largely to sepsis. In the latter cases the prognosis depends on promptness of rib resection and evacuation of septic material.

In aseptic cases since the main clot is below and posterior aspiration should be rather high and far forward—sixth or seventh interspace in midaxillary line. Replacement with oxygen is successful.

In cases with a small amount of hemothorax a simple serofibrinous pleurisy may occur, the blood acting as an irritant the signs of which may disappear in a few days with the exception of a mild pyrexia lasting a week or two. Pneumothorax is rare usually on the right side when present. It is best detected by X ray.

Bullets may cause merely a slit like wound of the lung other missiles large openings but the elasticity of the lung tissue tends to close the wound and bullet track rapidly. Blood infarction around the track may be quite extensive. Bullets often drop into the cul-de-sac of the diaphragm and do not require removal.

Injuries of the central zone involving the heart and great vessels are usually fatal but cases of recovery are reported such as the presence of a bullet in the ventricle wall detected by X ray. Grazing wounds of the heart may give rise to the pleuropneumocardial friction not infrequently found in injuries in the cardiac region. Treatment is usually expectant.

Owing to the dome of the diaphragm wounds involving both chest and abdominal cavities are not uncommon. Vomiting and hiccough in an injury of the chest should make one suspicious of abdominal complication. An occasional result is subphrenic abscess.

Perforation of the diaphragm on the left side has led to diaphragmatic hernia of which the diagnosis has been made only seven times in 300 cases.

In cases with lung collapse an important part of the treatment is the use of breathing exercises and in later convalescence hill-climbing.

HORACE BROOKY

Beck, E. G. The Healing of Old Cavities of the Chest: a New Procedure. *T. West Surg.* 4: St. Paul, 9 6 Dec.

Beck demonstrates a new method of treating old cases of osteomyelitis of the ribs and long bones which had previously undergone many operations and demonstrates three patients and roentgenograms and photographs of the different steps of the operative procedure.

The method has these five objects in view

1. To expose the diseased area by an adequate flap incision.

2. To take away every vestige of the diseased tissues under the guidance of the eye.

3. To close the wound in such a way as not to permit any dead space in the resected cavity; implant the skin-flap.

4. To use no suture material whatever except ligatures for arteries, and leave the wounds widely gaping.

5. To reproduce epithelium of granulating surfaces with skin-grafts.

By this method Beck has been able to cure nearly all the cases which had previously undergone operation and failed and which could not be cured by injection of bismuth paste on account of sequestra. There is practically no suture material used in the operation except a few rare exceptions. He deprecates the probe in trying to determine the depth of bone cavities and sinuses and furthermore he claims that scraping of bone cavities blindly without ocular inspection is unscientific and leads to grave error in diagnosis and treatment.

Shortle, A. G. The Ultimate Results in the Treatment by Artificial Pneumothorax. *J. Am. A.* 9 6 July 1933

The author concerns himself with the permanency of results, the patient's working ability, the condition of the expanded lung, and the amount of contraction of the chest wall. One hundred and four cases are used as a basis for this study.

A brief review of the current literature along these lines is given as well as several personal reports from men using artificial pneumothorax.

In the series 35 cases are to be eliminated as being inoperable. Of the 79 remaining cases 19 are today working and in good physical shape, while 3 were discharged as markedly improved and 37 are dead. Of the 19 working today 6 show rhonchi and rales after cough, 7 are negative and 6 have not been examined. Of the 13 examined for contraction the maximum was 3.75 inches and the minimum 1 inch. All but 3 have fully reabsorbed 7

have no sputum, 2 show negative sputum and 4 positive. The average displacement of the apex beat was 1 inch all the 13 cases being left-sided. Of the 23 inoperable cases 2 only are working, 16 are dead, and the other 7 are in bad shape physically.

Shortle believes his results are due to the following factors: (1) most of the cases were sanitarium cases where complete rest could be enforced; (2) they were of the more intelligent middle class, with sufficient funds to afford proper living conditions, and sufficient brains to lend intelligent co-operation; (3) they were treated in a favorable year-round climate; (4) they received small insufflations of gas, not over 500 ccm. and as a rule 250 to 350 ccm. this being the most important point.

F. M. CHASE

TRACHEA AND LUNGS

Scott, E. and Forman, J. Primary Carcinoma of the Lung. *Med. R.* 9 6 6, 452

A report is given of four cases of primary carcinoma of the lung, with microphotographs and review of the literature. In man carcinoma of the lung occurs in about 0.3 of one per cent of autopsies. Some four hundred cases have been published. Carcinoma seems to occur more frequently in the lungs of lower animals than in man, according to Siye occurring in 3 per cent of the cancers. A new growth usually arises in a large bronchus at the root of the lung and extends peripherally. In the cases reported there were no metastases. In lower animals metastasis outside the lung is not common. In none of the four cases reported was there any degree of anthracosis. At the periphery of the growth the cells may be so undifferentiated as to lose their carcinomatous texture. Most of the cases are diagnosed as tuberculous even in spite of negative sputum findings and are discovered only at autopsy.

H. G. SLAAN

HEART AND VASCULAR SYSTEM

Desplas, B. B. Wet Wound of the Heart: Projectile in the Anterior Ventricular Wall (Plaie du cœur par balle projectile dans la paroi ventriculaire (antrale). *Bull. et mem. Soc. d'chi. d. Par.* 9 6 Jan. 1933

In this case the wounded man was brought to the ambulance three hours after injury in a dying state. Radioscopy made immediately showed a bullet in the left ventricular wall of the heart. The man died twenty minutes later. Autopsy showed a vast left hemothorax, perforation of the superior lobe of the left lung punctiform perforation of the pericardium which was empty of blood, and finally a bullet embedded in the anterior left ventricular wall.

The point of interest for the author is that the man should have survived such injuries for a space of three hours. Riche who submitted this report, however criticized it. He pointed out that in heart

injuries immediate or even rapid death occurs only in one out of six cases. Moreover he thinks that if such a case were submitted to him showing the picture of a great hemorrhage and hemothorax, but with the preservation of the heart seat he would at once have placed the patient on the operating rather than upon the radioscopic table because hæmostasis was the most urgent indication.

W. A. BRENNAN

PHARYNX AND ESOPHAGUS

Hall A. J.: Case of Diffuse Fibromyoma of the Esophagus Causing Dysphagia and Death. *Arch. Radiol. & Electrotherap.* 1916 xxi 153

The author gives in minute detail the clinical history of a case of new-growth of the esophagus and also the complete postmortem findings. The

features of the case as demonstrated by the roentgen ray were not satisfactory owing to the failure of complete examinations. At the time of the first examination plates were made of the chest only; no study being made of the esophagus by means of the opaque meal. The second examination was made with the screen only and in this way an error was made which would have been obviated if plates had been made.

The value of the case to the roentgenologist should consist of the demonstration of the necessity of complete examination, where there is dysphagia, by both the screen and plate methods. While the exact pathological diagnosis could not have been made by the roentgen examination it would seem that diagnosis of an esophageal condition could have been made earlier in the case if the examination had been thorough.

W. A. FVAXE.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Babcock, W. W.: Correction of the Relaxed Abdominal Wall with Reference to the Use of Buried Silver Chain. *Am. J. Obst. N. Y.* 1916 lxiv 596

The author outlines the various types of abdominal relaxation considering the degree of relaxation and the symptoms produced. He finds that these patients suffer from indigestion, headache, flatulence, constipation and many other symptoms and often are greatly handicapped when in the erect position.

The weakness of the abdominal wall may be congenital, or it may be due to overdistention of the abdominal wall as from pregnancy, ovarian tumors, or ascites, or to the general relaxation associated with wasting and debilitating disease. Obesity increases the intra-abdominal tension, weakens the supporting walls by fatty infiltration and adds the drag of an increased subcutaneous mass. The weakness may be due to nerve injury or paralysis, particularly where long vertical incisions have been made through the anterior abdominal wall external to the semilunar line.

Palliative treatment includes methods that aim to develop the weakened musculature, and the use of supporting appliances such as a corset, belt or spring truss with or without a plate or pad. These are not discussed in the present paper.

Operative treatment for the relaxed abdominal wall include one or more of the following general principles:

1. The resection of an elliptical or other shaped area of skin to increase the tension upon the underlying structures.

2. A lipectomy or resection of the subcutaneous fat to eliminate this source of weight and tension upon the underlying parts, and to better the contour of the abdomen.

3. A reconstruction of the muscular and fascial planes of the anterior abdominal wall.

4. The reinforcement of the abdominal wall by the implantation of new tissue or of foreign substances, such as silver wire, kangaroo tendon, etc.

After discussing the relative merits of various procedures the author illustrates the various ways in which he has used a fine silver chain to support the weakened abdominal wall. He believes that it has a distinct advantage over the other foreign materials which have been used for this purpose in the past.

C. H. DAVIS

Blad A.: Studies Regarding Peritonitis Caused by Bile Without Perforation of the Gall Bladder or Bile Passages (Studien ueber Gallen peritonitis ohne Perforation der Gallenwege). *Tr. Af. Norik. Sv. Cong. Goeteborg* 1916 July

Peritonitis caused by bile without perforation of the biliary passages can be explained by a ferment action on the part of the bile and of the gall bladder wall. Pancreatic juice under certain conditions, especially after passage of a gall-stone frequently found in these conditions, can enter the common duct and the gall bladder rather easily. The trypsin here can become activated and digestion can take place. Experiments show that if bile is put into a dialysis tube biliary pigments do not pass through it but that if the colloidal bile is digested the pigments are liberated and pass very easily through the dialysis tube. The author observed the digestion of the gall-bladder wall in 16 dogs. If pancreatic juice was injected into the gall bladder or if it was forced in from the duodenum and the common duct ligated a peritonitis due to bile pigments developed in the successful cases even without perforation of the gall bladder. The gall bladder wall in these cases showed no changes macroscopically but in the microscopic picture a

total necrosis with complete destruction and softening of the wall was seen explaining the passage of bile readily

In the discussion LAGERBLOM asked whether the bile-colored fluid in the abdomen was not the result of a general icterus following the ligation of the common duct. Blad replied that the bile-colored fluid was found in the abdomen within a few days whereas a generalized icterus was not present. In other cases a local peritonitis developed with bile discoloration of all the organs around but otherwise there was no icterus.

L. A. JONSSON.

Stanton E. M. Postoperative Ventral Hernia; Study of the Hernia Following 500 Laparotomies. *N. Y. St. J. Med.* 96: 15

The author has analyzed the results of 500 laparotomies performed by himself with reference to postoperative hernia. His results so far as known were as follows. In the 500 cases 24 hernia developed. Median or rectus incisions gave less than 0.5 of 1 per cent hernia.

In regard to hernia in median incisions involving the lower quarter of the rectus sheath, it must be remembered that the transversalis fascia below the semilunar fold of Douglas is only one half the thickness of the fascia above. Unless this layer of transversalis fascia is united as well as the peritoneum nothing but the overlying muscle intervenes between an advancing hernial sac and the anterior sheath which is the last line of defense.

As regards the presence of infection in the operative field he found that 200 clean cases were followed by only 3 hernia while 186 operations in an infected field resulted in 18 hernia. In the latter cases drainage is chiefly responsible but the author believes a small drain in the rectus or midline incision does not materially increase the danger of hernia if good union is obtained in the sutured portions. If drainage prevents infection and suppuration through the length of the wound it reduces the possibility of hernia in the scar. From this it is argued that vaginal drains or secondary stab wounds for drainage are not indicated unless the operation is sure that the main incision stands a good chance of firm union without a drain at one angle of the wound. In his cases the hernia seemed to bear no relation to nerve injury with resulting rectus paralysis.

HORACE BROCK.

Raxetti L. A Case of Lumbar Hernia (Sobre un caso de hernia lumbal). *Ger. med. d. Laus.* 1916 xxii, 3

Lumbar hernia is comparatively rare. In 1904 Rochard could collect only 50 cases in the medical literature. Barlette in 1873 and Renaudie de la Garenne in 1726 have mentioned the possibility of lumbar hernia but it was Petit who in 1738 first gave a correct description of the affection. Petit

drew attention to the aponeurotic triangle between the great dorsal the great oblique and the iliac crest as the weak point whence a lumbar hernia might occur. Petit's doctrine stood till 1866 when Grynfeld demonstrated that there was another region also i.e. the quadrilateral in which such a hernia might occur. The author also reports a case occurring in this space. The patient was a man of 56 who in January 1906 fell from a height of about 3 meters. There were no lesions of importance except contusion in the left costal region and the man resumed work after a few days. A vague pain, however, persisted in the left dorsolumbar region and fifteen days after the fall he noticed that after a strain a lump appeared in this region, which although painless, yet made it difficult for him to mount a staircase.

Examination resulted in a diagnosis of lumbar hernia and operation was agreed to. Under chloroform an incision was made in the region of Petit's triangle but nothing was found. It was decided to dissect the fibers of the great dorsal muscle and open up Grynfeld's quadrilateral. Here a small reducible tumor was found. The administration of chloroform was temporarily stopped in order to note the effect of the patient's movements and it was then observed that the tumor augmented and herniated through the quadrilateral.

The hernia was treated as an ordinary hernia. The breach was widened after sectioning Henle's ligament. The sac composed of a transverse fiber was dissected and opened, the contents of the sac was a yellowish fat somewhat of the nature of perineal fat. The sac was treated by ligation and excision and the wound closed. The man recovered perfectly.

W. A. BARRETT.

GASTRO-INTESTINAL TRACT

Stapelmoor S. von A Contribution to the Pathogenesis of Phlegmonous Gastritis (Beitrag zur Genese der phlegmonösen Gastritis). *T. II.* *Verh. S. G. G.* Göteborg 1916 July

Four cases were reported two of which were operated upon one cured. Phlegmonous gastritis is divided into the circumscribed form and the diffuse form and according to etiology into primary and secondary forms. The secondary form can originate from contiguous structures by metastasis from some other focus. As a predisposing factor the chronic hyperplastic gastritis was present in each case. The infection *per se* was caused by streptococci. The author collected 4 cases from the literature, considering the treatment the duration (24 hours to 30 days) the symptomatology and the diagnosis of the disease while in most instances must be only a probable diagnosis, and these four are the only ones cured by operation. In one of these cases a diffuse phlegmon of the entire stomach and the diagnosis was uncertain. In the other three cases circumscribed phlegmons were found. To the latter is added a case of the ulcus.

In the diffuse form of the disease treatment is hopeless although it is advisable to perform a laparotomy to exclude other pathological processes of the abdomen. The circumscribed form is curable by drainage or a resection can be performed if the process has assumed a chronic or subchronic character.

BORTELUS recalled a case of diffuse phlegmon of the duodenum described by Fruing and Sjoevall. At the autopsy a fish bone was found in an ulcer of the duodenum with infection by streptococci.

L. A. JORNEE

Davis, B. B. *Perforating Gastric Ulcer*. *Tr West Surg Ass.*, St. Paul, 1916 Dec.

Only acute perforations are considered. The diagnosis depends on the very acute pain at the beginning coming on suddenly and usually at the very first located in the region of the perforation. A history of previous gastric or duodenal symptoms is common. The pain is more acute than in perforations of the appendix moreover perforation of the appendix scarcely ever occurs without some preliminary symptoms in the right iliac fossa.

Every hour that elapses after the perforation before operation lessens the chance of the operation having a successful outcome.

Operations are divided into two classes (1) Those done very early before much peritonitis is present. At this time the ulcer can be excised or turned in with sutures in such a manner as to partially obstruct the stomach outlet and a posterior gastro-enterostomy performed. Drainage should usually be used in these cases consisting of a large rubber tube inserted through a stab-wound above the pubes and passing into the lowest part of Douglas' cul-de-sac with or without additional drainage of the region of the perforation depending on the extent of the pathology and the amount of leakage. (2) Operations done after the peritonitis is fairly well advanced. Here the operation consists in doing as little as possible except to stop the leak and establish drainage. The perforation should be sutured in such a manner as to narrow the outlet of the stomach as little as possible. No gastro-enterostomy should be done at this time as it is too uncertain in its results and too dangerous. If gastro-enterostomy has to be done later it will be at a time when the patient's vitality has improved and he is in a better condition to stand it. Drainage is always used in this class of cases both via the cul-de-sac and the primary wound.

Irrigation of the abdominal cavity is strongly condemned in all cases also wiping out with sponges as it disseminates the infection and increases the rapidity of absorption of toxins and of micro-organisms. The peritoneum if the Fowler position is used cul-de-sac drainage and proctoclysis can take care of the foreign material in the abdomen much more safely and more gently than if irrigation is used.

Liek, E.: *The Operative Treatment of Multiple Callosous Ulcers of the Stomach* (Zur Kenntnis und operativen Behandlung des multiplen callosösen Magengeschwüres). *Arch. f. klin. Chir.* 1916 cvii 575

It is well known at the present time that the result of operations for stomach ulcer depends upon the site of the ulcer. Clairmont in von Eiselsberg's clinic showed that gastro-enterostomy in cases of ulcer near the pylorus gave 62 per cent good results in cases where the ulcer was distant from the pylorus there was only 47 per cent of good results. Other experienced surgeons, such as the Mayos showed gastro-enterostomy for stomach ulcer to be purposeless if not dangerous. At the Congress of Surgeons in 1914. Petthes explained the cause of this as due to the inhibitory action of ulcer on the rhythmic contractions of the stomach. In a gastro-enterostomy made at the deepest point of the stomach the peripheral part alone is unburdened and alkalinized but not the central stomach section. In ulcer of the small curvature spasm is the cause of the delayed recovery in spite of the good functioning of the gastro-enterostomy spasmus reduces the effective action of the gastro-enterostomy.

In discussing the comparative value of gastro-enterostomy and resection Liek quotes von Haberer who takes a strong radical view. In ulcer whatever may be its anatomical form resection is the method of choice. Von Haberer therefore resects upon principle gastro-enterostomy is reserved only for simple cicatrized pylorus stenosis. He prefers the resection method of Billroth II and does not hesitate to perform subtotal stomach resection. In one case unfortunately fatal, he even executed total resection of the stomach for callous ulcer. His primary mortality in all resections of the stomach due to ulcer was 9 per cent. The end results were good. Late examinations of a group of 86 patients operated according to the Billroth II method showed 77 per cent complete recoveries, 12 per cent partial recoveries, 10.5 per cent unsatisfactory results.

The frequency of multiple stomach ulcers has been underestimated. Von Hacker in 1895 drew attention to the appearance of plural stenoses of the stomach. Payr recently showed that in his operated cases there were 5 per cent of multiple ulcers. Von Haberer's figure is much higher. In 132 resection cases he found 26 per cent with multiple ulcers. Simultaneous duodenal ulcers are included in this figure. He lost 3 cases because at operation the duodenal ulcer was overlooked.

Liek's personal experiences regarding resection of stomach ulcer are limited. Of 24 operated cases of stomach ulcer there were 4 cases of resection. Of these three were callous ulcers the fourth case was a tumor like thickening of the pyloric ring. In these 24 operated cases multiple callous ulcers were found three times, 12.5 per cent. It is possible other ulcers were overlooked but in all cases the stomach was gone over systematically.

The danger of confusing ulcer with carcinoma

is considered differently. Some consider a wrong diagnosis as rarely possible, others consider it as relatively frequent. Payr finds carcinoma microscopically in 26 per cent of resected callous ulcers. Kuettners percentage is 43.4 per cent. These figures will naturally cause surgeons to reflect and suggest resection at the slightest suspicion of carcinoma. In multiple ulcers there is less danger of error multiple carcinoma of the stomach being infrequent. Regarding the situation of multiple stomach ulcers, there is usually a stenosing pyloric ulcer and a second or more on the stomach body. This combination is relatively frequent. Thus Lick finds in 32 cases of von Haberer not less than 15 with this localization.

Lick thinks that the decisive factor is the choice between resection and gastro-enterostomy is the danger of the operation. The mortality of resection is considerably higher. Riedel in his first 25 transverse resections lost 28 per cent. Kuettners in 914 gives for resection a 20 per cent mortality in gastro-enterostomy only 4 per cent. Even such an experienced surgeon as von Haberer had a mortality of nine per cent in resections and in gastro-enterostomy somewhat over 3 per cent. But von Haberer treated only the light cases with gastro-enterostomy.

Payr gathered from the literature up to 1910 465 cases of ulcer resection with a mortality of 6 per cent the mortality of gastro-enterostomy he figures as 3 to 6 per cent. Lick thinks the figure for resection appears almost too favorable. The number of cases from the great hospitals are published principally where masters of surgery work. Smaller statistics would if published he thinks give a less favorable result.

Usually only serious cases are resected. If one seeks to find how many of the gastro-enterostomy patients later developed carcinoma, one is surprised at the small number. Gressot gives 2.3 per cent. Kocher 5.6 per cent. Kuettners 1.7 per cent. If it is really true that carcinoma develops so frequently on an ulcer as its basis, as for instance, Wilson of the Mayo Clinic asserts that in 153 stomach carcinomas he could prove that the carcinomas developed upon the basis of an ulcer in 99 cases, 7 per cent the advocates of gastro-enterostomy might say that the above-mentioned small figures prove that gastro-enterostomy cures the ulcer and thus removes the basis for the development of carcinoma.

The higher mortality of resection is therefore not offset by a higher carcinoma danger in gastro-enterostomy. Moreover resection does not cure all cases of stomach ulcer. The larger statistics give about 70 per cent recoveries, 30 per cent mortality the remainder being merely betterments. While these figures, excepting the higher mortality almost agree with the results of gastro-enterostomy it must be emphasized that much more serious forms of stomach ulcer are treated by resection than is the case with patients treated by gastro-enterostomy. Lick, therefore taking a middle ground between the advocates of resection and those

who favor gastro-enterostomy concludes (1) Callous ulcer of the stomach is to be resected if its site is distant from the pylorus and also if there is the slightest suspicion of carcinomatous degeneration. (2) In stricturing ulcer of the pylorus if there is a second ulcer on the gastric body posterior gastro-enterostomy is to be employed. (3) If the second ulcer causes an hour-glass stenosis, gastro-enterostomy between both stomach sacs is indicated plus posterior gastro-enterostomy on the pyloric sac. (4) If these operations have not brought about the desired result further palliative methods are useless and all the affected stomach section must be resected.

W. A. BRIDENBACH.

Wlensky A. O.: The Surgical Treatment of Perforated Ulcer of the Stomach. Ann. Surg., Phila. 96 11 43

The operative treatment of perforated ulcer of the stomach or duodenum must be determined at the time of operation by the general condition of the patient and by the extent and degree of the associated peritonitis. In those patients who come to the surgeon late when any procedure is hazardous one of the following methods must be followed (1) closure of the perforation with adequate drainage of the peritoneal cavity (2) when this is impossible packing and drainage down to the area of perforation in which event a second operation becomes imperative as soon as the condition of the patient permits and (3) a jejunostomy is rarely the method of choice. There is another group of cases in which the patients are seen very soon after the perforation are in good condition, and in whom the infection is localized to the upper right quadrant of the abdominal cavity. In this group the question arises as to the advisability of doing something more than merely closing the perforation, with an idea of effecting a more rapid and complete cure.

The author gives the results of operative treatment of 19 cases. He does not believe that in the second group of cases the mortality is increased by gastro-enterostomy and advocates it in event the patient's condition will at all warrant it. The immediate mortality in these cases, regardless of operation performed, was 47 per cent. Ten of the patients were treated by immediate closure and gastro-enterostomy with a mortality of 30 per cent. Of those patients having a perforation more than 48 hours before operation, 100 per cent died.

In event the ulcer has perforated high up near the cardia in an inaccessible location, or in those cases in which the condition of the patient does not permit an extended search for the perforation the indication is to excise and put to rest the entire stomach and duodenum, and this is best done by jejunostomy and jejunal feeding. There are exceptional cases in which local conditions prevent excision of the ulcer in which a jejunostomy is indicated. Excision of the ulcer bearing area in the presence of an acute perforation is very dangerous and is rarely indicated.

G. NEWCOMB.

Leche, W. A Contribution to the Etiology of Cancer of the Oesophagus and Stomach. *Surg. Gynec. & Obst.* 1916 xliii 41

The author briefly touches upon the geographical distribution of cancer and having collected 4,020 cases of cancer of the oesophagus and a fairly large number of cases of cancer of the stomach discusses the reason for the peculiar distribution of the growths in those organs and compares this distribution to that of the cicatrices from swallowed corrosive fluids in the same organs.

This forms the working basis for the author's contention that the chronic irritation from the ingestion of hot fluids is an important predisposing cause of cancer of the oesophagus and stomach.

After a brief discussion of the occurrence of cancer in animals and a comparison between the cancer statistics of Norway and Italy the author concludes:

1. Cancer of the oesophagus and stomach is peculiarly prevalent among the inhabitants of the temperate climate zone.

2. The relative frequency with which cicatricial strictures from swallowed corrosive fluids occur in the various parts of the oesophagus increases from above downward. In other words the widest parts of the oesophagus are the most frequent sites of such strictures and for physiological reasons.

3. The distribution of cancer in the oesophagus corresponds to that of the cicatricial strictures from swallowed corrosive fluids and in all probability for the same physiological reasons.

4. Any part of the oesophagus and stomach may be the starting point of cancer with the exception of the pyloric sphincter which rarely seems to be the primary focus. The organ immediately beyond namely the duodenum, is practically immune from cancer. The reason for the two latter phenomena is probably that the ingesta do not reach the pyloric sphincter until they are properly modified.

5. In view of the foregoing conclusions it seems logical to look to the ingesta of civilized man for the source of chronic irritation which leads to malignant changes of the oesophagus.

6. The supposition that swallowed fluids after emanating from the cardia are directed along the gastric gullet to the prepyloric region, is strongly supported by the fact that the cicatrices from smaller quantities of swallowed corrosive fluids are usually found along this path.

7. Seventy nine per cent of cancers of the stomach are also found along this path—the cardia, the gastric gullet and the prepyloric region.

8. As cancer of the stomach follows the high way of the fluids it seems logical to assume that ingested fluids in particular may be responsible.

9. Alcohol and other irritating fluids probably play a part but in the opinion of the author hot fluids, so universally taken throughout the temperate climate zone, in the form of coffee, tea, soups etc. and giving rise to chronic irritation is the main predisposing cause of cancer of the oesophagus and stomach.

10. Cancer of the oesophagus occurs less frequently in women than in men, because women drink more slowly and take smaller swallows which pass quickly through thus saving the oesophagus while the less resistant mucosa of the stomach where the fluids come to a stop is more equally exposed in both sexes.

11. The fact therefore, that the ratio of cancer of the oesophagus in men and women is 3.5 to 1 while cancer of the stomach occurs almost equally frequent in the sexes points strongly to 'hot fluids' as the important predisposing cause. This is further substantiated by the results of a comparison between the cancer statistics and the habits of the people in the north and south of Europe by the relative freedom from cancer of the oesophagus and stomach enjoyed by the aborigines of hot climates, and the extremely rare occurrence of cancer of the oesophagus in animals.

Friedenwald, J. and Kieffer R. F. The Value of the Quantitative Elimination of Dissolved Albumin in the Gastric Contents in the Diagnosis of Cancer of the Stomach. *Am. J. M. Sc.* 1916 clii 321

Wolff and Junghans were the first to report a special method for the estimation of the soluble albumin in the gastric extract which they claim is of great value as an aid in the diagnosis of gastric cancer. More recently Smithies has confirmed the value of this test.

From a careful study of their own cases together with the cases of others, the authors feel justified in concluding that the Wolff Junghans test is of great value as an aid in the diagnosis of certain forms of gastric carcinoma, and when taken in conjunction with the other signs of the disease may be of the greatest diagnostic help. The test is however only useful in the diagnosis of the disease when there is an absence of free hydrochloric acid in the gastric contents and then only when the question of even traces of blood can be eliminated, and in the absence of all retained food residue or of swallowed saliva or sputum.

The test has its greatest significance in the diagnosis between simple and malignant achylia. Positive reactions are rarely observed in simple achylia while they are frequent in cancer.

In fractional analyses in simple achylia the acid and protein curves follow each other closely, while in malignant conditions there is a marked divergence between the protein and acid curve.

Positive reactions occurring under normal conditions or in simple achylia gastrica appear in dilutions of one-tenth, one-twentieth, one-fiftieth, while when still present in dilutions of one one hundredth, one two hundredth and one four hundredth there is marked evidence of malignancy.

The test is positive in at least 83 per cent of gastric cancers presenting an absence of free hydrochloric acid and in 72 per cent of early cases. It occurs almost as frequently as the absence of free hydro-

chloric acid in this disease—80 per cent absence of free hydrochloric acid to 82 per cent positive Wolff Junghans reactions. It is more frequent than the presence of lactic acid—presence of lactic acid, 8 per cent positive Wolff Junghans test 93 per cent—or the Oppler Boas bacilli—presence of Oppler Boas bacilli 76 per cent positive Wolff Junghans test 83 per cent.

A positive reaction rarely occurs in malignant growths in the abdomen not involving the stomach in gastric ulcer except in cases associated with stenosis and dilatation or in chronic gastritis or simple achylia. While the test is of value as an aid in the diagnosis of gastric carcinoma, it is only then of significance when taken in connection with the other signs of the disease and thus is an additional means of aiding in the detection of a disease frequently most difficult of diagnosis.

G. RUSSELL

Gramen, K. Pyloric Exclusion (Ueber die Pylorid.) *T. V. North S. G. G. (outberg)* 96 July

The author re-examined 3 cases operated upon by Key the period of observation ranging from eight months to eight years. In 17 cases Wilms method—the suturing of strips of fascia around the pylorus—was employed and the X-ray examination in all cases showed complete exclusion of the pylorus. In 6 cases Russer's method was employed—partial division of the posterior wall of the antrum and suture to the anterior wall of the ventricle—and failed in two instances due probably to the suture giving way in the muscularis which was end-to-side. After the method of Wilms quite few recurrences result if ligation with silk is employed before the fascial strip. Only 3 of the operated patients had any postoperative symptoms. One had symptoms of pancreatic disease another showed adhesions when examined by the X-ray and in the third patient the emptying of the antrum was too rapid.

LINDBSTROM stated that he had had occasion to perform two autopsies on cases of pyloric exclusion. In one case the Wilms operation had been performed. One half year later the pylorus showed lumen the thickness of a lead pencil. In the other case the pylorus was folded in by means of deep sutures. A year and a half later the pylorus was normal, showing no effects of the previous operation.

L. A. JONAS

Giovanni O. Exclusion of the Pylorus by Introflexion of the Serosa in the Enteric Lumen (*Intussuscezione del piloro con introflessione della sierosa nel lume enterico*) *Gazz. d. esp. Roma* 1916 xxviii 965

Giovanni describes a new method of excluding the pylorus, based on the power of peritoneal adhesions and for which he claims certain advantages over the established procedures of Eiselsberg and Wilms.

Giovanni makes an incision involving all the layers and about 5 to 6 cm. long following the longitudinal axis of the tract lying between the stomach and the first portion of the duodenum. He turns in the walls in such a way that the serosa of the two walls are brought together in the intestinal lumen. To facilitate the formation of adhesions, he abrades all the mucosa visible at the time of the incision and places a few stitches so that a portion of the serosa may be in contact with the walls stripped of mucosa. The serosa beyond is sutured over the whole extent including the angles of the incision and the whole is protected by a piece of omentum sutured over it.

This procedure has been carried out experimentally on dogs in conjunction with gastrotomy and gastrostomy. After some weeks there was evidenced good functioning of the new opening and there was then reason to believe that the tract of the canal between the stomach and first part of the duodenum had been transformed into an impervious cord.

W. A. BARRY

Jefferson, G. Carcinoma of the Suprapapillary Duodenum Casually Associated with Pre-existing Simple Ulcer *Brit. J. Surg.* 36 iv 300

A middle-aged man was operated upon for symptoms of food retention in the stomach at operation duodenal ulcer. All appearances of the simple peptic ancy were discovered in a gastro-enterotomy was performed and the patient made a good recovery. Three and a half years later he died, and postmortem examination revealed carcinoma of the suprapapillary duodenum extending into the head of the pancreas obstruction of the duct of Wirsung with retention cyst of the pancreas metastatic carcinoma in two of three glands at the liver hilum chronic peritoneal peritonitis of both sacs. The removal of the gastro-enterotomy made three and a half years before was patent and normal. The pylorus was normal and separated from the growth by 2.5 cm. of healthy though dilated duodenum.

The author is inclined to believe that the patient had a latent duodenal ulcer for some time and that the gastro-enterotomy brought about complete relief for two and a half years when malignancy overcame and destroyed his life. The onset of pancreatic diarrhea—copious, fatty, pale offensive stools containing easily recognizable portions of undigested food—as signs of the complete absence from the intestine of the pancreatic ferments was coincident with the rapid decline and loss of flesh ending in death.

The bile-duct was not obstructed the bile alone being not sufficient to give faecal coloring such as due to interaction between the secretin and pancreatic juice. There was no glycosuria at any time although the pancreatic duct was completely obstructed and it has been common observation that the islands of Langerhans are unaffected in great length of time.

Duodenal cancer causes death in one out of every 2 500 hospital patients that come to autopsy.

Cancer of the small intestine occurs in 3.1 per cent of cases upon the basis of 4 177 intestinal carcinomata, but of these 75 per cent have developed in the duodenum.

Fifty per cent of all duodenal cancers are situated in the second part of the duodenum owing to the complications of the duodenal wall in this region by the ampulla of Vater. Fenwick's analysis of 51 cases showed that the first part was infected in 11 cases, the second part in 29 and the third part in 7. Geuser's figures point to the rôle played by the ampulla in augmenting the incidence of cancer in the second part of the duodenum for in 71 cases 51 or 71.8 per cent were peri-ampullary.

The gastric mucosa seems to be more susceptible to cancer than the duodenum for several cases are on record where a duodenal ulcer has extended through the pylorus and become malignant in its gastric portion only.

The occurrence in some duodenal carcinomata of cells other than those of the usual cylindrical variety has led certain observers to believe that the neoplasm could not have started from the columnar cells of the duodenal wall.

The author summarizes as follows:

1. Carcinoma of the duodenum is a rare disease. It is found in 0.04 per cent of hospital postmortems i.e. deaths from all causes.

2. Inch for inch the duodenum is more liable to cancer than the rest of the small intestine. Of 71 small intestine carcinomata, 34 or 48 per cent were in the duodenum.

3. A causal relationship between simple ulcer and cancer is difficult to establish in the case of the duodenum. The author in recording a case of his own has been able to find in the literature only 30 cases in which carcinoma seems to have developed upon ulcer. Several of these cases are very doubtful.

C. G. HERR

Borchgrevink, O: Entero-Anastomosis to the Greater Curvature (Enteronastomose auf der Curvatur major). *T. XI. North. Surg. Cong.* Goeteborg 1916 July.

The gastroduodenal ligament is ligated along the greater curvature and for a distance of 14 cm. is separated from the pylorus. The ventricle is now brought through a rent in the mesocolon in the usual manner and a gastro-enterostomy is performed after opening the ventricle between the vessels in the anterior and posterior wall. The author believes the method offers the following advantages: the opening is in a location where the ventricle and duodenum can easily be inspected with the gastroscope. It is extremely easy to apply clamps and sutures as everything is freely movable and without tension. An incision here does not injure the longitudinal muscle at all and the circular layer is divided at the junction of the fibers. The jejunum adapts itself to the ventricle much better

than in other operations. Finally it is theoretically an advantage to make the opening at the best possible location in the antrum. The only disadvantage is the fact that the separation of the ligament and the numerous ligations of vessels prolong the operation somewhat. The method has been employed in 64 cases of gastric and duodenal ulcer. No fatalities occurred from the operation, but one patient died on the fifteenth day from a pulmonary embolism and another from a perforation of an overlooked ulcer at the cardia. The method has given the author better results than those previously employed. All patients have been re-examined and all are satisfied with the result obtained. In two cases however there was for a whole month severe regurgitation of bile into the ventricle with vomiting.

In the discussion DAHLGREN asked whether after such extensive ligation of vessels the nutrition of the parts did not suffer to which the author replied that the blood supply of the ventricle was so abundant that no danger existed. L. A. JUNKER.

Long, J. W.: Enterostomy; a Perfected Technique. *Tr. South. Surg. & Gynec. Ass.* White Sulphur Springs, 1916 Dec.

Enterostomy should never be done as a matter of choice. When indicated it is a life saving measure and has rescued many a patient from an untimely grave. The indications may be roughly grouped as follows: (1) to relieve temporarily patients suffering with intestinal obstruction as from carcinoma of the colon; (2) to safeguard an operation done at the same sitting as resection of the bowel; (3) to overcome the evil results of a previous operation for instance obstruction following abdominal section; and (4) to establish an opening through which to feed a patient as a jejunostomy done for inoperable conditions of the stomach. An application of enterostomy was illustrated by a case of intestinal obstruction following abdominal section. Purgatives are not permissible, enemas fail and the patient grows rapidly worse. It is in cases of this kind that enterostomy offers the greatest relief.

A general anesthetic is not necessary. Tact on the part of the surgeon and a local anesthetic amply suffice. The patient need not be moved from the bed. Under the plea of dressing the wound a few stitches are removed and the edges of the incision gently separated. When the peritoneum is opened one should not search for the point of obstruction unless it be easily reached but content himself by dealing with the first distended coil of intestine that presents itself. The emphasis is upon *distended* since it is worse than useless to puncture the bowel below the obstruction. When the obstruction is purely mechanical and no sepsis is present more freedom is allowable. Without disturbing the parts unduly a purse string suture, preferably of chrome gut, is placed into the bowel wall. The needle should be introduced rather deeply. An area a good half inch in diameter is

included. By catching the suture at two equidistant points with forceps and the untied ends between the fingers, sufficient tension can be maintained to serve the double purpose of steadying the parts and reducing the soiling of the field to a minimum. While the suture is being held the pencil point of a thermocautery is made to slowly burn a hole into the intestine. The cautery is preferable to the knife or scissors.

Whenever it is possible to do so the omentum should be drawn about the tube and, if need be, stitched in place by one or two fine plain catgut sutures. A splendid plan is to puncture the omentum and pass the distal end of the tube through it. Utilization of the omentum to safeguard the intestinal opening both before and after the tube has been withdrawn can not be too strongly emphasized.

When the perforation has been done with the cautery the edges properly inverted and the parts surrounded by omentum the tube usually heals of itself very promptly. The author has had twelve that did not leak a drop either before or following the removal of the tube. While there is no operation more serviceable than an enterostomy when indicated there can be nothing more annoying than a fecal fistula that will not heal. The technique presented reaps the benefits of the one and avoids in a large percentage of cases the evil effects of the other.

Quain E. P. A New Instrument for the Application of the Sewing Machine Stitch in Gastro-Intestinal Surgery. *Tr N M S S Am St Paul*, 96 Dec.

Absolute hemostasis is necessary for safe and successful gastro-intestinal surgery. Attention is called to the double interlocking through-and-through running suture made by the ordinary sewing machine. Wherever this type of suture can be applied to living tissues bleeding is practically impossible. A special curved needle has been made with an eye near the point and a flat handle to which one end of the catgut is fastened. The catgut runs in a groove on the convex side of the needle shaft through the eye near the point and the other end is tied to a long needle which serves as a shuttle. The special needle is pushed through the tissues about to be sutured until the eye with a loop of catgut appears on the opposite side. The shuttle needle carrying the other end of the catgut is passed through the loop and the special needle is withdrawn. This forms the interlocking sewing machine stitch and is then used for the posterior suture in gastrojejunostomy. For the anterior suture line the same stitch is made by passing the needle from inside the jejunum out through the serosa, then over to the gastric margin which is penetrated in reverse order. The catgut loop is picked up by the shuttle needle on the gastric mucosa.

Quain has used this suture in 17 gastro-enterostomies and excisions of gastric ulcers, and in 3 bowel

resections. To prove its hemostatic efficacy gastric lavage was given after the gastro-enterostomies. Only an occasional shred of clotted blood, which probably escaped during the operation was found in the stomach. By this method he has been able to save nearly half the time previously employed in gastro-enterostomy.

This method has a place in other surgical fields. It has been applied with satisfaction in hemorrhoidectomy, thyroidectomy, etc. but it is not practical for skin sutures.

Draper J. W. Intestinal Obstruction. *J Am M Ass*, 96 Nov 20.

The cause of death in intestinal obstruction is still unknown but all recent studies point to aberrant activity of the duodenal and probably pancreatic cells. The old hypothesis that the toxin is of bacterial or food decomposition origin may be looked on as discarded. Dehydration is of no greater importance in this than in other toxemias.

There is an important ratio between the toxicity of the intestinal epithelium and its digestive power. The intricate syndrome autotoxemia occurring in man will be better understood when we know the cause of death in duodenally obstructed dogs.

EDWARD L. CORRELL.

Starr C. L. Intussusception. *Child J M & S*, 96 21 33.

This paper is based upon 46 cases, with 31 deaths and 15 recoveries. The time of admission varied from three hours after the onset of symptoms to eight days. The average time of admission of all cases of intussusception during the past 5 years at the Children's Hospital has been fifty-seven hours. The best time to diagnose a case of intussusception is during the first twenty-four hours. The average admission time of the fatal cases was seventy-four hours and the admission time of the recovered cases was thirty-two hours after the onset of symptoms.

In regard to the etiology, in most of the cases there was a history of intestinal disturbance, either marked constipation or diarrhea and it was also a fact that three-fourths of the cases occurred in the summer months when intestinal infections are most frequent.

In a child under two years of age the onset of acute pain, vomiting, collapse, one or two fecal stools, followed by straining and the passage of blood and mucus and possibly a palpable tumor are characteristic diagnostic signs of intussusception.

In ilocolitis there is always some fecal content whereas in intussusception no bile or bowel content passes after the first one or two stools.

The author believes that surgery is the only treatment and the diagnosis is readily made within the first twenty-four hours. If operation is performed within the first twenty-four hours it is comparatively easy to reduce the intussusception. It is after this period that the amount of con-

gestion and edema of the tissues makes reduction almost impossible and the only operation in the nature of a resection that the author advocates is the so-called Jessup's operation. C G HEYM

Eddy I H Perforation in Typhoid Fever; Report of a Case Associated with Acute Typhoid Appendicitis in a Child Aged Seven *Surg Gynec & Obst* 1916 xxii, 451

The frequency of perforation varies greatly in different epidemics. The author's study of the literature shows that about 12 per cent of the total death rate is due to this complication and that about 80 per cent of the perforations are found in the lower ileum. 50 per cent of the perforations occur during the second and third week and the trouble is twice as frequent in adults as in children. Jopson was able to find only 21 cases under ten years of age prior to 1909. Violent muscular movements, distention, diarrhoea, vomiting, dietetic errors and separation of the slough are given as factors predisposing to perforation.

The onset is sudden and is characterized by severe pain of rapid progressing intensity, local tenderness, chill, vomiting and collapse associated with a rapid rise in temperature, pulse rate, blood pressure and leucocytosis.

The importance of an immediate diagnosis is emphasized and the differential diagnosis of acute appendicitis, hemorrhage, ileus, acute intestinal obstruction, acute pelvic lesions, and infections of the gall bladder are discussed in detail.

The treatment is surgical. In the choice of incisions one should not lose sight of the fact that 80 per cent of the perforations occur in the lower part of the ileum. The perforation can be closed in most cases by a purse string suture reinforced by Lambert or mattress sutures, care being taken not to constrict the gut. Free drainage should be established, the Fowler position assumed and morphine employed until the peritonitis becomes well localized.

The case is reported of a child, age 7, who complained of headache August 28, was seen by Dr. Nicholson September 9, temperature varied from normal to 105°. Was seen in consultation by the author September 15, September 17 at 7 p. m. the patient was seized with a chill, vomiting and severe pain in the right side followed by collapse. The temperature rose from 102.8 to 105.6° pulse from 120 to 160 in two hours; leucocytosis 32,000.

The child was removed to the hospital for immediate operation. The appendix was removed, a perforation about 16 inches from the ileocecal valve closed and two additional ulcers that showed clearly through the peritoneum reinforced. The child made a splendid recovery and was shown at the Chicago Medical Society at the time the paper was presented.

The author's conclusions are as follows:

1 While perforation varies greatly in different epidemics, about 12 per cent of the total death rate is due to this complication.

2 Perforation occurs in about 3 per cent of all cases treated. It is relatively infrequent in children.

3 Statistics show that over 80 per cent of the total perforations occur in the lower ileum.

4 The location of perforation coincides with the study of Baer.

5 The majority of cases perforate during the second and third week.

6 Diarrhoea is an important factor in its production.

7 Acute abdominal pain during the course of typhoid should always be taken seriously.

8 The sudden rise of blood pressure is positive evidence of perforation while an unchanged pressure is not of negative value.

9 The importance of a careful study of the blood cannot be overestimated.

10 The welfare of the patient depends on the physician's ability to differentiate between the symptoms of perforation and those of the resulting peritonitis.

11 The treatment of perforation is surgical, and the death rate is in inverse ratio to the length of time allowed to elapse before operation.

12 Opium is indicated as soon as perforation has taken place and should be continued until the peritonitis has become well localized.

Nix J T Jr Rare Case of Intestinal Stasis and Its Treatment *South. M J* 1916 ix, 908

The author reports the case of a woman, 34 years old, who had suffered with symptoms of intestinal stasis for more than fifteen years. The transverse colon was hopelessly kinked from caecum to sigmoid exhibiting the most extreme type of ptosis.

At operation adhesions between various surfaces of the small bowel and abdominal parietes were thoroughly divided and the raw peritoneal surfaces sponged with a sterilized 3 per cent solution of sodium citrate in order to prevent subsequent adhesions if possible. The lower end of a Murphy button was inserted in the rectum and held in position at the beginning of the sigmoid. The ileum, at a point near the ileocecal valve, was divided between clamps with a Paquelin cautery. The cecal end was closed by a continuous suture and inverted with a purse string suture, while into the upper end was inserted the other half of the Murphy button. The halves of the button were joined and the operation completed. After twelve days the button had not passed but with a little traction upon the silk tape it was easily removed. The patient made an uneventful recovery.

The advantages of the application of the Murphy button for short circuiting are:

1 Simplicity. The method is shorter by fifteen minutes than the suture method.

2 The most dangerous section of bowel from an infectious standpoint, the colon, is not incised, but simply punctured with a Paquelin cautery thereby eliminating contamination.

3 It is an end-to-side anastomosis simulating the ileocecal valve

4. If the button lodges and is not passed in due time, it can be removed with slight traction upon the attached thread.

LEONARD L. CORN, LL

Yeomans, F. C. Malignant Transformation of Benign Intestinal Growths. *Med Rec* 96 xc 537

The benign tumors of the colon and rectum are the solitary polyp, multiple polyps, adenomata, and the villous tumor, all of which have a common origin from the intestinal mucous membrane. The etiology of these growths is unknown, the causes advanced being entirely theoretical. Clinical experience justifies the belief that most of them are inflammatory in origin, as evidenced by the frequent history of a preceding dysentery or colitis and by therapy regression following removal of the irritating substances by colonic lavage.

That benign growths may change to malignant is beyond doubt, but why this occurs cannot be explained. All that can be stated positively is that cancer begins as a small local process that it excites no reaction in the blood whereby a diagnosis can be made that the individual cancer-cell is the parasite of cancer and whatever eventually explains the origin of cancer will also explain the transformation of a benign into a malignant growth.

While malignant change in a simple polyp is rare, such changes do occur from repeated traumata and both single and multiple polypoid adenomata should be removed at the earliest moment.

Villous tumors differ in no way from simple adenomata except in form and size, though they may be clinically malignant on account of their tendency to bleed. These growths should also be extirpated early.

Multiple adenomata constitute the most important form of benign growths of the intestine, the chief danger being their tendency to change in adenocarcinomata. The treatment is palliative and operative. Enterostomy prevents fecal irritation of the tumors but it must be maintained for a long time after the disappearance of the growths. Removal of the tumors singly or en masse is unsatisfactory because of the liability of a malignant recurrence. The ideal procedure is radical extirpation of the portion of the colon involved, probably best done by operating in two stages, first ileostomy and later colectomy. Should the tumors disappear after enterostomy the opening may be closed if they persist, after a prolonged trial of irrigations, a partial or total colectomy is indicated.

E. K. ARMSTRONG.

Turner, G. G. Dangers of Intestinal Exclusion. *Brit. J. Surg.* 961 7

Operations on the intestinal tract are performed in which no outlet is provided for the intestinal mucous secretion. This oversight sometimes leads to fatal results.

There is a large amount of secretion from the mucous membrane even under normal conditions and when stimulated into greater activity by irritation or infection it may be enormous, as in the familiar example of colitis.

A portion of the bowel is said to be completely excluded when it is cut off at both ends from the rest of the intestinal canal, though retaining its normal vascular and nerve mechanisms. There is abundant clinical evidence to show that a large amount of secretion continues to be poured into the excluded loop. Should the contents of the excluded bowel remain sterile it will be filled with mucus and will become gradually distended until either its wall gives way or a cyst forms. The latter is liable to infection which may subsequently perforate into the peritoneal cavity.

The following illustrative cases are given:

1. The first a malignant growth of the ascending colon was excised, both ends of the bowel being closed and a lateral anastomosis made between the lower ileum and the transverse colon. The ileocecal valve proved competent and the cecum burst, this gave rise to a localized abscess, which ultimately led to perforation of the external iliac artery and the death of the patient seven weeks after the operation.

2. The patient was a man, aged 40, who was admitted to the hospital with a diagnosis of cancer of the cecum. Upon further observation the diagnosis was amplified to malignant growth of the cecum associated with abscess. The first operation was for drainage but at the end of three days there was no respite in the obstructive symptoms and an ileostomy was performed. The patient made an immediate recovery and left the hospital. Nine weeks later he was readmitted as an abdominal emergency. The patient stated that after leaving the hospital his condition improved, the bowels acted regularly and he was able to return to work. A little pus was discharged from the cecal fistula but never any fecal matter. The opening gradually became smaller. On the day of admission, at 11 o'clock in the morning the patient was seized with severe abdominal pain with vomiting and upon admittance to the hospital the abdomen was rigid and very tender.

At operation a median incision below the umbilicus was made and a large quantity of thin purulent matter was found in the abdomen. The anastomosis was perfect. The cecal growth was larger than at the previous operation but without signs of perforation or sloughing. The blind end of the ileum, however, was found to be distended to four times its normal size with several small yellowish areas as though the wall were sloughing, but with no actual perforation. This cystic ileum was delivered out of the abdominal wall and opened and Paul's tube inserted. The man made a rapid recovery and left the hospital at the end of two weeks but subsequently died of the malignant growth.

The author's explanation of the case is that after the short-circuiting of the parts the growth gradually involved the ileocecal valve causing complete obstruction so that the excluded portion of the ileum could not empty its contents into the large bowel. The secretion collecting in the cul-de-sac became infected from the ulcerating growth the subsequent events being the counterpart of what occurs in acute appendicitis. C. G. Herz

Quarelli B. Study and Researches on the Ileocecal Region (Studio e ricerche sulla regione ileocecale) *Giornale di Accademia di medicina di Torino* 1916 lxxix 191

Upon the basis of the literature of more than 300 publications and on the careful study of 230 cadavers besides many cases studied during life the author criticizes the four morbid syndromes in the ileocecal intestinal segment which have been formulated in recent years. These syndromes are those comprised under the names cæcum mobile, membranous pericœlitis, chronic intestinal stasis (Lane) and the insufficiency of the ileocecal valve (Herz)

With regard to cæcum mobile the clinical researches and autopsy findings of the author leads him to conclude that it is not a distinct disease as it very often occurs with a complete absence of clinical disturbances and because even in the more pronounced forms it represents only a particular congenital disposition and is in fact only part of an enteroptosis which cannot be considered as a disease

Regarding Lane's theory of chronic intestinal stasis the author directs attention to the adherences about the termination of the ileum appendix ascending colon, etc which Lane considers as *legamenti accessores ad acquisiti* created by nature to prevent the prolapse of certain intestinal segments.

While the author acknowledges that the material on which his conclusions are arrived at is rather limited when compared with the large number of English and American observations yet he believes (1) that although Lane's kink may owing to the obstacles created, cause a series of clinical symptoms demonstrable by the X-ray and a complex of anatomopathologic alterations only by further studies can a decisive opinion be arrived at regarding this entity (2) that the mechanism of production of a Lane's kink is not always identical (3) that it does not appear to be demonstrable that there is a band of new formation in the sense described by Lane

Regarding Jackson's membranous pericœlitis, Quarelli prefers the theory of congenital origin of the membrane and thinks that it is the persistence of the right epiploic diverticulum the cœlic epiploon of Haller. This was put forward as a simple hypothesis by Keller of Galveston and was demonstrated by Levent in France on a certain number of fetuses. The author's researches on

cadavers have shown it to be absolutely true in all cases which respond to Jackson's original description moreover he has been able by careful dissection to establish almost constantly the direct continuity of the membrane with the great omentum both by its anatomical features and by its vascular dispositions.

With regard to the etiological question of the insufficiency of Bauhin's valve the author's studies have led him to these conclusions. The valve which is incontinent in the fetus and in the infant till about the end of the first year is perfectly continent in the normal adult during the contractions of the cæcum. But it may become incontinent because of (1) anomalies of formation (2) ectasia of cæcum (3) chronic processes (such as perityphlitis) (4) by contracture of the ascending colon and consequent increase of cæcal pressure (5) by specific lesions (ulcer tuberculosis etc.) (6) according to Herz by alteration in the mucosa

The author finds from his studies that valvular insufficiency is especially concomitant with cæcal ectasia and the occurrence of chronic processes and that it is secondary to them and that contrary to Herz's view insufficiency of the valve is not an autonomous morbid entity

The author further is of the opinion that cæcum mobile membranous pericœlitis Lane's kink and valvular insufficiency are all only variations of the same syndrome which has assumed a particular individuality according as the originators of these so-called entities were attracted to particular manifestations of the anatomopathologic alterations met with. There is one essential factor in all these that is that all these affections only cause trouble by one method, retardation in the progress of the mechanical function of intestinal evacuation.

The author does not agree with the mechanical theory that intestinal stasis is a function of restricting bands and torsions because it does not explain all cases. He thinks there are two varieties of stasis i.e. functional or dynamic stasis and mechanical stasis

The particular class of mechanical stasis which occurs in the ileocecal segment alone has occupied the author's attention and for these he proposes this classification

- 1 Stasis due to ileal inflexion.
- 2 Stasis in the cæcum and ascending colon
- 3 Stasis due to obstruction at the level of the left colic angle
- 4 Stasis due to sigmoidal alterations

The first two forms are the most important. Ileal stasis and stasis of the right colon are distinguished from terminal stasis by the fact that the former is accompanied by phenomena of general intoxication which are either wanting or very slight in the latter

Ileal stasis is in the opinion of the author clearly dependent on Lane's kink, as has been proved by manifold observations but it is otherwise with stasis of the right colon. Operative interference

alone will clear up the cause of these, and different cases will show that they may be due to these causes

- 1 Habitual torsion of the caecum.
- 2 Caeco-colic inflexion.
- 3 Membranous pericolicitis
- 4 Peritonitis secondary to affections of the appendix, biliary passages etc
- 5 Either primitive or secondary insufficiency in the muscular tone of the caecum.

The surgical treatment will depend on what is found in the individual case. W. A. BROWN

Wohl M G. Sarcoma of the Appendix. 4
Surg Phila 916 141 3

Sarcoma of the appendix is rare there being reported in the entire medical literature but 1 authentic cases. There is great difficulty at times in determining histologically whether or not the condition of the appendix is of a chronic inflammatory or of a neoplastic nature. In making a diagnosis, the author urges that the clinical picture be taken into consideration as well as the microscopic findings. Sarcoma of the appendix, especially the round-cell type, contrary to the viewpoint held heretofore, is highly malignant. There is a chronic inflammatory condition of the appendix in which a marked adenomatous and endothelial proliferation occurs, that has been considered carcinoma, but the clinical history of such cases does not bear out this assumption.

The treatment of sarcoma of the appendix has usually been simple appendectomy. The prognosis is less favorable than in carcinoma of the appendix. The author presents a table with brief histories of all cases reported to date including one of his own.

G. M. OOO

Sherrill, J G. Acute Appendicitis. 4m J Surg
1916 xxx 283

Sherrill discusses in detail the differential diagnosis of acute appendicitis from (1) rupture of right tubal pregnancy (2) acute intestinal obstruction, (3) pneumonia of the right lower lobe, (4) gall bladder affections, (5) right-sided renal and ureteral lesions, (6) inflammatory disease of the right tube and ovary (7) the gastric crisis of tabes (8) typhoid fever particularly with intestinal perforation, (9) tuberculous peritonitis and intestinal tuberculosis and (10) cecal or appendiceal carcinoma.

The author believes that operation should be performed in all cases of acute appendicitis as soon as the diagnosis can be made. If in acute lesions involving the right lower quadrant the diagnosis cannot be arrived at with certainty he considers it surgically wise to operate first and perfect the diagnosis afterward. He has found that a high leucocyte count 30,000 to 38,000 has usually been of good prognostic omen.

He does not employ iodine within the peritoneal cavity on account of the adhesions which it induces. Formerly he was accustomed to irrigate the

abdomen in cases of appendiceal peritonitis, but he has discarded this technique.

For an anesthetic he uses nitrous oxide and ether or nitrous oxide alone in young children occasionally chloroform. Within an hour after operation the patient is placed in a slight posture. Proctoclysis is used whenever indicated, and the stomach irrigated when necessary. No food is given until nausea has disappeared and no attempt is made to unload the bow is until after four days. He reports one death in his last 24 consecutive cases. ALBERT EHRNFRIED

Ehrnfried, A. Appendicitis—a Record of Personal Experience in 1915 4m J Surg 96,
ix 89.

Ehrnfried speaks of the advantages of the end-result system established by Codman, when applied to the practice of the individual surgeon. He describes the modified plan which he has adopted, and proceeds to apply it to his experience with appendicitis during the year 1915.

Of 71 cases of appendicitis which he operated upon 49 were male and 22 female. The youngest was 9 and the oldest 50. There were 8 interval quiescent cases, 18 acute undrained cases, 20 acute drained, 13 appendix abscesses or localized peritonitis and 3 general case peritonitis. Of the interval cases three fourths were in women. The proportion of women decreased as the severity of the condition increased and less than one fourth of the general peritonitis cases were females. Three males died, one acute appendicitis of septicemia, one general peritonitis of septicemia, and another general peritonitis with advanced phthisis and a white count of 1000 6 hours after a brief operation, probably from shock. There was one case of postoperative pneumonia, which recovered, and one case of exacerbation of a phthisis. Three youths with peritonitis developed a toxic erythema, one of which was diagnosed as scarlet fever. Otherwise there were no complications. Excluding these cases the average stay in the hospital for the entire series was 7 days.

The anesthetic was ether by the drop method. Under ether anesthesia Ehrnfried believes one can operate rapidly and if the administration is smooth, with a minimum of shock. The skin was prepared on the table using benzine full-strength iodine Harrington's solution, and alcohol in sequence. This preparation leaves a narrow frame of iodine marking the limits of the operative field, which preserves its natural color.

The author advocates the muscle-splitting or gridiron incision where no contra-indication exists. This technique allows of a direct and rapid approach without destruction of nerve or muscle-fiber and practically without hemorrhage. In clean cases it brings one down onto the caecum near the base of the appendix and if an abscess is present it allows of a short and direct drainage tract which does not soil the general peritoneal cavity. Oftentimes it

opens external to the line of adhesion of omentum to the anterior abdominal wall and as a result the abscess can be treated practically as if it were without the peritoneal cavity. No walling off with gauze is used except when the incision fails to open directly into a discrete appendiceal abscess.

The wound is easily closed a running catgut stitch to peritoneum a catgut mattress suture for each muscle layer transversalis and internal oblique, and a subcuticular silk-worm-gut stitch in the skin. The short horizontal scar in the flank is scarcely noticeable. Hernia following this operation even in drained cases is practically impossible one reason being that the nerve supply to the muscles is not damaged.

For drainage a cigarette wick is placed to the base of the appendix or into the abscess if such exists. This is partially removed on the fourth day and taken out on the fifth. If in the presence of a copious discharge a sinus persists it is dilated every second day with the little finger and balsam of Peru is poured directly into the wound the skin edges being approximated by adhesive straps.

Ehrenfried does not employ the muscle splitting incision in young children in fleshy pendulous abdomens nor in women in whom there is a question of tubal infection, in appendiceal abscess where the tumor can be felt near the median line or in cases where exploration is intended. In this series it was used 47 times against the right rectus 24.

As for the after treatment in clean cases the author allows water to be given immediately upon request. Food is omitted for twenty four hours unless the patient was starved before operation and morphia is given sparingly when needed. After twenty four hours the patient is given broths malted milk made with water and orange albumin as desired and a suds enema is administered. On the next day soft solids are started. If all goes well the patients sit up in a chair for a half hour on the fourth day and thereafter for increasing periods.

The peritonitis cases have been treated by withholding food and water by mouth for 48 hours maintaining the Fowler position administering 10 per cent glucose solution per rectum in sufficient quantities and giving suds or milk and molasses enemata as indicated. Recently the author has used pituitrin to forestall or relieve distention giving as many as six or more ampoules in twenty four hours always with apparent benefit. He has not refrained however in cases of severe distention, from using the time honored methods of stapes drastic enemata, and gastric lavage in the rare instances when they have been indicated.

Backer Groendahl: Chronic Appendicitis and Disturbances of Cecal Function (Ueber chronische Appendicitis und cecale Funktionsstörungen). *T. A. North Surg. C. 2* Goeteborg 1916 July.

In the author's experience (170 cases) he has found chronic appendicitis to be most common in women

most of them under 30 years of age. In one-third of the operated cases anomalies of the colon were present (atony ptosis caecum mobile). Appendectomy produced the best results in those cases in which there were changes in the appendix or in which a clear history of previous attacks was present. If however the operation was performed for dyspepsia or stasis the result was poor and it was worse in the cases with associated anomalies or changes in the colon. These cases, however can be cured by prolonged medical or eventually surgical treatment. L. A. JOHNSON.

Shawalter A. M.: When to Operate in Appendicitis Cases. *Virg. M. Semi-Monthly* 1916 xxi 169.

The time to operate in appendicitis is just as soon as a diagnosis has been made. In those cases in which consent is refused the author will not assume the responsibility and insists that another physician be called. Operation is thought to be the safest form of treatment even after the second or third day the secret of results depending upon what is done to the individual case. When infection is limited to the appendix there is no more danger in operating the fourth day than there is the first while if it is not limited the sooner drainage is instituted the better. In these cases conservatism is the keynote.

The author believes that an exception should be made in cases in which the mental attitude of the patient and family are unfavorable or where the patient's physical condition would render the shock of the operation extremely dangerous.

E. K. ARMSTRONG

Lynch J. M. and McFarland, W. L.: Colonic Infections. Some Rarely Observed Unclassified Types. *J. Am. M. Ass.* 1916 lvii 943.

In studying the intestinal canal it should be looked on as a unit, the divisions being marked by the sphincters into oral central and caudal. It is the unusual infections of this last segment that the authors are concerned with. Twenty-one clinical cases are studied and the literature reviewed.

It is demonstrable that the rate of progress of intestinal contents is directly proportionate to their toxicity i.e. the greater the toxicity the greater the progress. Hence the greater the toxicity the less the digestive and absorptive power of the intestine thus automatically acting as a protection for the organism.

The conception that the ileocecal valve is a mechanical one is erroneous as experiments show it to be a neuromuscular contrivance controllable by injections of epinephrin. Again the inhibitory center located in the terminal ileum no doubt plays a considerable rôle in constipation.

Follows then the detailed histories of two cases of colonic infection, one acute and the other chronic. In the series 11 were acute, and 10 chronic, the average age of the former being 26 that of the latter 37. The average duration of the acute was 32 months and that of the chronic 6 months.

In the majority of cases there is a sudden onset of diarrhea, blood mucus and quantities of pus with rapid pulse and high temperature. No specific organism is found. The rectal mucous membrane is edematous, dark red, and granular with no definite ulcers. Later the edema diminishes, patches of exudate appear and numerous ulcers make their appearance. Under treatment these gradually disappear and the typical dry shiny appearance of atrophy takes place. The histopathology is that of an acute inflammation of the mucous membrane and its subjacent structures. No unusual forms of bacteria or predominant forms are found on bacteriological examination of the discharges. In 50 per cent of the series the appendix showed similar pathology.

A brief review of the literature on colonic infection is given, most of the cases, however, being of the specific type, no attempt being made to differentiate these from the non-specific.

Of the 11 acute cases 9 were operated on. Of these 3 are cured, 3 are almost cured, 2 are improved, and one died.

Of the 9 subacute cases 8 were operated on. Of these 4 are cured, the other 3 being complicated by multiple polyposis and while improved are likely to recur.

The operation of choice is ileostomy with local rectal treatment next appendicectomy with irrigation.

The deduction is drawn from this series are:

1. Acute purulent infections of the colon can be cured only by putting the involved area at rest.

2. Striking improvement in the acute cases is seen after ileostomy.

3. The old idea that if a stoma were made in the small intestine the patient would lose ground has been proved a fallacy.

4. A stoma to be effective must be placed oral to the infection.

5. The infection usually begins as an acute process and is often overlooked because there is no definite ulceration.

6. The segmental character suggests diminished tissue resistance due to a change in the autonomic nerves, a bacteriological fact.

7. No active bacterial agents have as yet been demonstrated. P. M. CHASE.

Reed, C. A. L. Treatment of Constipation by Conservative Surgical Correction of Retardative Displacement of the Colon. *J. Am. Med. Ass.* 1916, 12, 986.

The chief causes of constipation are ptosis with retardative angulations of the colon, large, flabby cecum dilated ascending colon atrophied or redundant transverse colon retardative angulation at the splenic flexure retardative angulation at or near the terminal ileum with or without adhesions and redundancy of the sigmoid. It is the correction of these by surgical means that Reed advocates.

The central idea in surgical treatment of mechanical stasis is to restore as far as possible the physiologic drainage of the intestines. This may be accomplished in two ways:

1. By radical measures such as excision of the cecum, resection of the transverse colon or sigmoid, colectomy or other short-circuiting operations.

2. By conservative measures such as plication of the mesocolon, fixation of the sigmoid, gastropexy and omentopexy. Reed's method falls in the latter class and is known as the parietal implantation of the colon. Its object being to permanently restore the ptotic colon and stomach to their normal position.

The important step in the operation is the suturing of the omentum to the transversalis fascia after an incision through the upper part of the abdomen. This not only fixes the transverse colon and stomach but raises the cecum and relieves the retardative angulations at either the hepatic or splenic flexures. Previously all inflammatory conditions have received appropriate treatment.

Emphasis is put on the point that this is merely a conservative method and is not intended to supplant any of the more radical methods. Hence, to be successfully used the cases must be carefully selected.

The author has used this method alone in 236 cases and in 62 others in combination with some other procedure such as cholecystotomy, resections, omentostomies, etc. and reports a gross mortality of 2 per cent with no deaths where parietal implantation alone was used.

Permanent results varying from marked improvement to functional cures are reported in 250 of these cases. P. M. CHASE.

Martin, F. Colon Resection and Its Indications. *Medical Age* 1916, 35.

There is no doubt that cancer of the colon is an undisputed surgical problem which should be dealt with by widespread resection, the sooner the better.

In analyzing the results of colon resection, no case should be reported favorably until it has been kept under surveillance for a considerable period, as its merits are to be judged by ultimate results. The operation is strictly of a major sort and should be undertaken only in obstinate and exaggerated cases, but before the development of a toxemia that itself will defeat the good effects of the operation. It is an operation too hazardous to be undertaken for the relief of constipation alone, it being better to treat the localized obstruction or sharp angulations which are present in so many of these obstinate cases, rather than do a total resection. The dangers attending the operation are remote postoperative ileus as well as immediate obstruction.

While the colon is a part of the human economy which can be dispensed with yet in the majority of cases of resection a considerable portion of the colon is always left this being sufficient to take on

the function of the part removed, and this main tained and free drainage established intestinal toxemia ceases.

Despite the fact that physiologists point out that thirst and diarrhoea are theoretical dangers of colon resection as a matter of fact they are not observed no serious physiological derangements occurring in a series of fifty colic resections done by the author five of them complete. The chief dangers are the operation *per se* and the possible immediate and remote obstructions that are liable to follow

E. K. ARMSTRONG

Falkenberg Carcinoma Flexurae Sigmoides.
Deutsche med Wchnscr 1916 xlii, 1 77

Falkenberg operated upon a patient 66 years old for extended carcinoma of the flexura sigmoidea. He refers to the technical difficulties of onilateral large intestinal resection with union by circular suture. This resection was based on Schmedens method. After a liberal mobilization of the flexura, Falkenberg made a large anastomosis between the afferent and efferent intestinal loops closing the abdomen over this after executing extrapertoneal resection of the diffuse carcinoma tous mass. More than 25 cm. of the large intestine was resected. The intestinal ends were closed with blind sutures, tamponed and replaced. There was an undisturbed recovery. This method is suitable in the author's opinion, for cases in which extensive mobilization of the large intestine is possible. It is a unilateral method of resecting the large intestine without the danger of extended circular suture union

W. A. BRENNAN

Campbell W. F.: Cancer of the Rectum *Med Times* 1916 lvi 282

In studying cases of rectal cancer the author is convinced that cancer in this region shows less conformity to the incidence of old age than cancer occurring in any other region. A diagnosis of hemorroids especially at the cancer period of life should be verified by sight as well as by touch the early symptoms of cancer of the rectum being altogether indefinite and resembling the symptoms of hemorroids.

The diagnosis of cancer of the rectum is usually made late yet it remains local for a long time and much may be done for the patient. A colostomy should be done in all cases of rectal cancer while the growth should be treated as when occurring in other regions namely by regional and not by local extirpation. Heretofore too much emphasis has been placed upon the restoration of normal function and too little on the eradication of regional lymph nodes. Inadequate operations are followed by a high percentage of recurrences.

The percentage of recurrences in the low operation was 63 per cent, in the abdomino-perineal operation the percentage was 18 per cent. One should insist upon as thorough extirpation as in cancer of the

breast and to accomplish this resort must be had to the abdominal anus and the abdomino-perineal operation.

E. K. ARMSTRONG

Saphir J. F. Rectal Operations under Local Anesthesia. *N. Y. M. J.* 1916 civ 644.

Saphir advocates more extensive undergraduate study of rectal diseases and more frequent rectal examination of patients especially when complaining of some condition in the rectal region.

During the first two months after the opening of the rectal department in Gouverneur Hospital O. P. D. out of the 65 new patients 50 were operated upon in the clinic under local anesthesia of quinine and urea hydrochloride. Saphir gives the histories of 19 operated cases for the following conditions hemorroids, skin tags fistula, fissure, polyp and dermoid with uniformly good results up to two months after operation. In a note he states that of 176 rectal cases in the rectal O. P. D. during the first seven months 124 were benefited by rectal operation under local anesthesia.

CARL R. STEINKE

Hirschman L. J. Etiology of Vaccine Treatment of Pruritus Ani *Proctol & Gastroenterol* 1916 x, 193

From bacteriological studies made in 25 cases diagnosed clinically as pruritus ani, Hirschman draws the following conclusions

Vaccines whether autogenous or polyvalent do not accomplish a cure in any considerable portion of cases only four out of the series being improved.

Streptococci can be isolated from practically every case. In the author's series streptococci were found in 100 per cent of the cases and the streptococcus faecalis was isolated in 88 per cent of them. This organism has been described by Horder and Andrews as the most common form from the point of distribution, the most resistant to unfavorable conditions and the least pathogenic of the streptococcus species. It is non hemolytic and while it has no action on raffinose and inulin it always ferments mannite.

GATEWOOD.

LIVER PANCREAS AND SPLEEN

Oehlecker: Pedunculated Tumor of the Liver (Stielgedrehter Tumor der Leber) *Deutsche med Wchnscr* 1916 xlii, 1086.

In the case reported by Oehlecker the patient had for years been suffering from stomach and intestinal trouble. A movable tumor in the stomach region had been noticeable for four years. After several examinations the case was diagnosed as movable kidney on the right side and pyonephrosis was recommended owing to the presence of pus and some albumin in the urine. However, from the clinical symptoms Oehlecker diagnosed the kidney like tumor as a tumor in the abdomen with a simultaneously existing cystitis.

On laparotomy a pedunculated twisted tumor of

the liver was found. The pedicle of the tumor sprang from the edge of the left liver lobe. The tumor was removed and the recovery was uneventful. Histologically the growth was an adenoma of the liver.

According to Thiele such tumors have only very rarely been treated surgically. Orshlecker states that the method of Voelker and Lichtenberg will often very clearly show change of position of the kidneys. Pyelography was not used in this case because of the danger of infecting a healthy kidney. Pyelography should be resorted to only after all other methods of examination have failed. The responsibility for a collargol X-ray picture can be assumed only by one who is familiar with all the pathologic conditions of the urinary tract.

W A BR W

Fay O J. Traumatic Surgery of the Liver. *J. W. Surg. Ass. St. Paul*, 96 Dec.

The question of the treatment to be employed in the presence or suspected presence of injury to the liver is answered when the diagnosis is made—laparotomy is indicated in every case of probable rupture of the liver because of the imminent danger from hemorrhage. Operations upon the injured liver must be performed with all the speed compatible with gentleness and thorough examination of the abdominal viscera. In an appalling number of cases an injury to the liver is successfully repaired only to have the patient go on to autopsy instead of recovery, with the embarrassing discovery that injuries to other viscera or other lesions to the liver had been overlooked.

Temporary control of hemorrhage can usually be obtained by tamponing. Suture of the wound, ligation of the larger vessels and tamponing are the most serviceable definitive procedures. Suture may be employed in cases where there is little or no loss of substance and the wound is clean-cut. It may be preceded by the ligation of larger vessels, and in many cases must be supplemented by tamponing. Ligation of the larger vessels is to be employed wherever there is troublesome hemorrhage from accessible wounds. The wounds may then be tamponed either directly or indirectly or autured. Tamponing is the method employed in the largest number of cases. It effects temporary hemostasis until other measures can be employed. It controls hemorrhage from wounds which are inaccessible, or which could be reached only by unwarranted incisions. It is the least time-consuming procedure and is, therefore, the method of choice where the patient is in a precarious condition. It is a valuable adjuvant to suture of a wound where hemostasis is not assured or the possible presence of other liver injuries cannot be excluded, and in every case where the simple ligation of vessels has been employed it is essential where the presence of infection cannot be excluded. Where the wound has been sutured or is very small the tampon may be removed at a comparatively early period.

but in more severe injuries and particularly in those cases in which tamponing has been the chief method of treatment the tampons should be left undisturbed until the seventh or eighth day and then removed slowly a little each day until on the tenth or twelfth day their removal is complete.

MacLeod N. Notes on the Radiography of the Gall Bladder. *Am. Rad. Soc. Electrol.* 96.

MacLeod reports the roentgen findings in 9 cases. The technique included Spark gap 35 to 45 inches, milliamperage with ordinary tube 2 to 3 with Coolidge tube 8 to 12, distance from plate 23 to 27 inches, time of exposure 5 seconds to 2 minutes, position of patient on back, compression with inflated rubber cushion. Of the 29 cases examined, 7 were reported as presenting abnormal shadows and 9 of the 7 were operated and confirmed. Of the 9, 6 had calculi and 3 had distended gall bladders. Of the original 29, 1 had typical biliary colic and 9 of these furnished positive roentgen results, with operative confirmation in 6, the other 3, not being operated upon. Various minor points are given, but the essential fact is that a very high percentage of positive roentgenographic findings was obtained in the cases of cholecystitis, with and without stones.

ALBERT MILLER

Schachner A. Anomalies of the Gall Bladder and Bile Passages. *Am. Surg. Phila.* 96, in 49.

Anomalies of the hepatic region follow the rule of anomalies elsewhere, that they are apt to occur in connection with other malformations. In reviewing the literature, the author was able to find 66 anomalies of which 4.8 per cent are multiple. The cause of the biliary hole incision is considered as being responsible for incomplete surgery as well as being a cause for the overlooking of many interesting congenital deformities.

There have been five cases of double gall bladder reported. Each bladder had its own cystic duct. There is recorded one case of bilobed gall bladder. In a dissection of the gall bladder there is one large cavity and a smaller recess communicating with it. It is very difficult to state whether such an anomaly is congenital or due to an inflammatory process. There has been no case of hour-glass gall-bladder discovered except as the result of a pathologic process occurring in adult life.

Sixteen intrahepatic gall-bladders have been found. They may be confused with a left-aided or absent gall bladder. According to Dévé, this anomaly is most common in infants and reptiles. A left-aided gall bladder occupies a position to the left of the falciform ligament and 3 cases of this type are on record. Such gall-bladder may be entirely overlooked at operation, or confused with a congenital absence. In transposition of viscera the liver not only is reversed, but the heart, duodenum, and stomach as well. Of this anomaly 11

cases are recorded. There are records of 7 cases of agenesis of the gall bladder two of which were complicated by absence of the quadrate lobe. This of course does not include the cases of absence due to destruction through pathologic processes. Absence of the gall bladder is not uncommon in the elephant camel goat and deer and in some species of fish and birds.

A floating gall bladder has a distinct mesentery and is usually attended by a wide range of mobility. Eight cases of this type are recorded.

Grant, W. W. I. Rupture of the Gall Bladder
Surg. Gynec. & Obst. 1916 xlii 422

The author reports two cases of non traumatic rupture of the gall bladder one an empyema ten years after a primary operation for gall stones. At the second operation a single smooth stone was removed from the dilated cystic duct. There was no obstruction and no jaundice. The patient's general health was good until six months before the rupture. Dyspeptic symptoms and recent tenderness over the gall-bladder were the only indications of trouble. Had cholecystectomy instead of drainage been done at the primary operation more trouble and danger would have been experienced in the subsequent history and operation.

The second case was that of a woman of seventy two years with well-defined and conclusive history of gall-stone. The diagnosis was perforation and general septic peritonitis from rupture. Operation was refused. Postmortem showed a contracted gall bladder around a single large stone with a small gangrenous area through which the rupture had occurred and a pint of bile had escaped into the right kidney fossa. The specimen of gall bladder with liver tissue shows the gall bladder stone and the reverse side shows a lighter colored stone in the liver substance—probably a branch of the hepatic duct. A timely operation would have saved her life but would not have revealed the second stone—no matter whether the operation was a cholecystostomy or a cholecystectomy. The latter operation is indicated only in small and gangrenous bladders.

Hendon, G. A. Cholecystitis With and Without Gall Stones and a Classification of Symptoms
T. South S. & Gynec. Ass. White Sulphur Springs 1916 Dec.

This article is based upon an analysis of 30 personal cases and deals with the factors of age sex disability and the symptoms of stomach trouble.

Jaundice colic acute indigestion, etc. Certain cases are reported in detail which appear to illustrate the different phases referred to in the text two of which are without previous history of gall stones. Two other cases illustrate the effect of gall-stone disease of long duration. In one case symptoms of gastric ulcer seemed to predominate, in one apoplexy of the gall bladder had occurred and in another the gall bladder had ruptured.

Borellus, J. I. Early Operation in Acute Cholecystitis (Frucoperation bei akuter Cholecystitis)
Tr. XI North Surg. Cong. Goeteborg 1916 July

During the acute stage of cholecystitis Borellus formerly operated only in the presence of urgent symptoms in the majority of cases he advised operation only after cessation of the acute stage. Since the beginning of the year however he decided in favor of the early operation and acted accordingly. Borellus has treated over 600 cases of gall stones at the surgical clinic of Lund between 1898 and 1916 and has performed 531 operations on the bile passages. During this time 126 cases of acute cholecystitis entered the clinic including (1) 21 operated upon during the acute stage (2) 50 operated upon during the subacute stage (3) 55 not operated upon.

Of the 21 cases of Group 1 the gall bladder was perforated, and in several other cases it was gangrenous without any macroscopic evidence of perforation. In 12 cases cholecystectomy was performed in 3 others cholecystectomy choledochotomy and hepatic drainage in 3 cases cholecystostomy and in 3 other cases laparotomy and drainage of the peritoneal abscess. Of the 5 fatal cases one should have been operated upon 2 days and another 6 days earlier according to the principle of the early operation and would then have had a better chance for recovery.

Of the 50 cases of Group 2 cholecystectomy was performed in all of them. The cause of death in 2 cases was pulmonary embolism and in 1 cardiac failure. Of the 55 cases not operated upon in Group 3 one died of cardiac disease. In 2 cases the operation was contra indicated on account of old age in 16 on account of cardiac weakness adiposity asthma, nephritis, leukæmia etc. In 23 cases the patient refused operation after the acute symptoms abated. In 13 cases no reason was given and probably the same reason existed. The author is of the opinion that it is desirable to perform radical operations upon as many of these cases as possible and since patients will decide in favor of operation during the acute stage much more readily, and since the operation during the acute stage is not more serious than during the chronic stage if the surgeon has had sufficient experience he has therefore adopted the early operation as a routine in these cases.

In the discussion BERG stated that while it is advisable to operate early in all cases of acute cholecystitis (pericholecystitis, peritonitis) it is difficult and frequently impossible to make the diagnosis. He has been considering what the findings should be at the early operation for acute cholecystitis. Aside from the purely typical cases there is frequently found a case corresponding to the symptoms of acute cholecystitis and at operation no signs of it are present, but severe pathological changes (combined with infection) having in common that the function of the gall bladder is perverted. It is uncertain whether it should be

called hydrops, stasis or something similar. The speaker preferred the term *cholecystosis*. This and this alone predisposes to stone formation. At the operation as well as at the autopsy there is found in these cases a distention of the common bile-duct and of the hepatic duct, as well as of the entire biliary system. The diagnosis is difficult but it can be perfected. What is accomplished by operation? The stones can be removed but what should be done to relieve the cholecystosis? A hepaticocystomy or a fistula between the gall bladder and common duct might be feasible, but at the present time a cholecystectomy is perhaps the better procedure. In 2 cases, however the speaker had a recurrence with stones in the hepatic duct.

PAUL discussed the material of Bull. Patients operated during the quiescent stage after acute attacks recovered quickly (cholecystectomy performed most commonly). In acute cholecystitis with perforation and abscess 5 out of 13 died.

ROVINGO criticized the expression "early operation in acute cholecystitis" as we are dealing with the last severe stage of a long drawn out disease. The reason that so many are extirpating the gall bladder is based on the erroneous theory that gall stones are formed in or are the result of an infected gall bladder. The speaker has proved however that the gall bladder is sterile in over one-half of the cases and if infection is present with gall-stones it is secondary. If cystostomy is performed stones do not recur and it is unsurgical to remove the gall bladder and shut in the infection. If the bile is infected drainage must be instituted.

BRZO during the last few years has only rarely performed cholecystectomy and rarely drained and has never regretted it. He cited cases with ulcer in the gall-bladder and lymphangitis with edema and exudation around the hilum (occasionally icterus) and interstitial pancreatitis which were cured after the removal of the gall-bladder. It is admitted that cholecystectomy is more serious.

BORELIUS in reply to BRZO stated that the cases operated by him all showed severe peritonitic changes and that the gall-bladder in most cases was gangrenous and in many cases was perforated. In reply to ROVINGO he stated that the cholecystectomy in acute cholecystitis resulted in healing much quicker and more surely and that the operation with sufficient technique was not more serious than the drainage. In definite cases of cholangitis Borelius does not ligate the cystic duct and pen up the infection but drains the hepatic duct.

ROVINGO maintained that if drainage is properly performed with a tube inserted into the gall-bladder and the latter dropped into the abdomen recurrences do not occur. Recurrences are frequent however after removal of the gall-bladder (Roos). In addition the gall bladder has a function to perform in the human organism.

BRZO stated that if Rovingo like others has found stones without the presence of infection the fact does not exclude an infection having been present.

ROVINGO returned that experiences with stones in the urinary passages have shown that stones do not become sterile in time. A proof that stones do not follow infection is found in the fact that chronic cases of infectious icterus mentioned by the author after a few years did not lead to stone formation and no such cases are recorded in the literature.

BORELIUS agreed completely with the views of ROVINGO and thinks it is only a temporary fad in surgery demanding extirpation of the gall-bladder. He would much rather perform cholecystostomy once, twice or three times with local anesthesia than remove the gall-bladder. He has found typical recurring attacks after cholecystectomy and found absolutely nothing at second operation.

BRZO stated that the recurrences could be due to a dilatation of the bile passages with later stone formation.

L. A. JENSEN

Sprengel: Gall-Stone Disease in the Light of Its Onset (Die Gallensteinkrankheit im Lichte der Anfalloperation) *Arch f. Klin. Chir.* 1906, cxxii, 379.

Sprengel compares the onset of cholecystitis with appendicitis and tries to simplify the manifold picture of cholecystitis. Regarding the origin of gall-stone attacks Riedel has traced this back to the irritation due to the calculi which causes local inflammation and transudation. He thinks that the origin of gall-stone colic lies exclusively in the sudden and lasting occlusion and the consequential retention of gall-bladder contents, which, in accord with the virulence of the bacilli present leads to greater or less destruction of the gall-bladder. This opinion is at variance with that of Kehr and other writers who consider the occlusion as mechanical and a causal factor only and who moreover regard the chronic and acute inflammatory processes as independent.

Sprengel considers the gall-bladder changes as divisible into groups: gall bladder changes with acute attack, cholecystitis destructiva, where the calculus is not removable and the gall bladder contents are virulent, cholecystitis simplex, where the calculus is loose and the gall-bladder contents non-virulent, this is the usual typical gall-stone colic, hydrops of the gall-bladder which is a permanent closure with non virulent contents. In the changes of the gall-bladder with chronic illness he includes empyema in which the occlusion is imperfect. In another group he places all residues of past conditions which have passed into the quiescent stage, and in which reparatory proceedings are predominant, such as scar formation, shrinkage, etc.

W. A. BREIDEN

Riedel: Subdiaphragmatic Collections of Pus and Gall Due to Gall Stones (Ansammlung von Eiter oder Galle unter dem Zwerchfell infolge von Gallensteinen) *Deutsche med. Wochenschr.* 1906, xlii, 058.

Riedel says that both operative procedures and autopsies have demonstrated several ways in which

pus or gall may accumulate above the liver as a consequence of gall-stones. The principal ways in which this might occur are

1. By the formation of abscesses under the liver dome in connection with a cholangitis purulenta due to stones in the ductus choledochus and ductus hepaticus.

2. From suppurations around primary gall-stones existing in the bile passages the gall bladder being free from stone

3. From rupture of the suppurated stone-containing gall bladder into the liver with abscess formation in the latter or by suppurations of the liver by perforation of the inflamed gall bladder

4. By perforation from the stone-containing gall bladder into adhesions when these cover the gall bladder and anterior border of the liver and moreover when the adhesions are intimately intermingled with the anterior abdominal wall. Such rupture usually occurs in the space in front of the *ligamentum triangulare hepatis*

5. After perforation of the gall bladder the pus may diffuse to the under side of the liver and in this way cause a subphrenic abscess posterior to or in front of the ligament previously referred to

Riedel thinks that such accumulations of pus or bile between the liver and diaphragm are comparatively rarely effected through the agency of gall stones. Suppurative processes arising from hepatic calculi with cholangitis (calculi in the common duct) may in some instances cause a perforation of the liver dome. Such a rupture is very rarely brought about by stones isolated in the liver when the gall bladder and common duct are free

The most frequent cause of subphrenic pus or bile collections is rupture of the fundus of the stone-containing gall bladder with its extensive diffuse interlacings in the front abdominal wall. To remove such accumulations Riedel recommends that an incision be made below the twelfth rib and the thinner part of the *ligamentum coronarium* separated with drainage by means of a thick tube traversing the body from front to back.

W. A. BREWSTER

Hoover C. F. and Blankenhorn M. A.: Dissociated Jaundice. *Arch Int Med* 1916 xviii, 589

The term dissociated jaundice carries with it the inference that either the pigment or the salts of bile formed within the liver are separately shunted from the biliary path into the lymph or blood vessels of the liver. Thus far it has been shown that bile salts may be shunted in this manner but it is not yet certain that bile pigment formed in the liver is separately shunted into the blood stream. This is what would be expected *a priori* when the comparative facility with which the salts will pass through a dialyzing membrane is considered, as shown by the concentrations of bile required to yield pigment and bile-salts respectively to the dialysate when colloidal sacs are employed for dialysis and also when the fact is considered that the renal filter will

yield bile-salts to the urine from a lower grade of cholemia than is required for bile pigment to appear in the urine

The authors found true dissociated jaundice of hepatic origin in two cases of primary anaemia, and in two cases of lead poisoning. In the four cases bile-salts were found in the blood in large amounts that is, the qualitative test for bile-salts in the plasma dialysate was quite as strong as found in complete jaundice of pronounced severity

Excepting in jaundice of hæmolytic origin and in complete jaundice which has undergone renal dissociation the authors have never found bile pigment without bile-salts in the plasma.

Bilirubin and bile-salts may both be present in very marked concentration in the plasma and neither pigment nor salts appear in the urine

Absorption of bilirubin in the plasma may not only withhold the pigment from the renal filter but also from the tissues so that it may be pronounced cholemia (pigmental) without choluria (pigmental) and also without icterus of the tissues

When pigmental cholemia is present—in varying degrees—without choluria, the colloidal sack will yield no pigment to an aqueous dialysate from the plasma. When choluria attends cholemia (pigmental) the colloidal sack will yield bile-pigment to an aqueous dialysate from the plasma.

Bile-salts will dialyze from plasma when no bile salts are demonstrable in the urine

Without an examination of the plasma the assumption is never justified that biliary elements have not been retained in the blood.

GEORGE E. BELL

Hellstroem N.: Two Operated Cases of Hæmolytic Icterus (Zwei operierte Fälle von hæmolytischen Ikterus). *Tr. XI. North Surg. Cong. Goeteborg*, 1916 July

To 43 cases in the literature Hellstroem adds 2 of his own and 2 of Borelius. The results of extirpation of the spleen are good, as patients feel well after the operation are without anæmic symptoms the icterus ceases etc. The primary changes in the blood forming organs with decreased resistance of the erythrocytes however does not improve after the operation.

BORELIUS demonstrated 2 extirpated spleens. In one case icterus was absent in the other it was mild but hæmolytic was present in both

ROYSIG stated that 50 cases have been observed in Denmark which shows that the disease is not so rare as is believed. He reported a case of his own which also showed gall stones but these were left untouched

L. A. JUNKER

GIL I G.: Surgery of the Bile Passages (Cirugía de las vías biliares). *Repert de méd. y cir.* Bogotá 1916 vii, 489.

The author summarizes the cases of biliary lithiasis treated in the surgical clinic of the Hospital of Medellín. From the experience gained by the

study of these cases he thinks the following conclusions can be drawn as regards the symptoms of icterus

1. Calculus of the gall bladder or in the cystic duct cannot produce icterus.

2. The icterus which appears with colic or a little later which disappears totally and does not return unless with colic, signifies the passage of a calculus.

3. Persistent icterus of varying intensity but most intense during colic and which partly disappears signifies obstruction of the common duct by calculus.

4. Persistent icterus each day more intense and accompanied by colic signifies complete obstruction of the common duct by retained calculus.

5. Persistent icterus without a history of painful crisis or subdiaphragmatic symptoms, and which is not accompanied by colic signifies compression of the common duct most commonly by a tumor of the head of the pancreas.

With regard to the gall bladder the author reaches these conclusions

1. In obstruction of the cystic canal the gall bladder is distended the bile which it contains is resorbed and the inflammation increases the quantity of mucus. There is easily observed external tumefaction sensible on palpation, but there is no icterus nor liver hypertrophy.

2. If there is grave infection the contents become purulent the dilatation and eventual tumor progressively increase there is great sensibility muscular resistance and hepatotoxic fever.

3. In partial or complete obstruction of the common duct, the gall bladder being healthy and the cystic duct permeable the liver increases in size and the gall bladder distends. Sometimes this way an enormous tumor reaching to the iliac crest, is formed. If weve in the great majority of cases, 80 per cent the gall bladder has previously been the site of a chronic inflammation and on this account is commonly small.

4. With symptoms of obstruction of the common duct the gall bladder appears contracted 50 per cent of cases of biliary lithiasis and dilated 100 per cent of cases of compression by tumor.

All the above conclusions are of great value in differential diagnosis.

Surgical treatment according to the author is indicated (1) in frequent attacks of colic (2) in dyspeptic disturbance produced by lithiasis (3) in cases of dilatation of the gall bladder by obstruction of the cystic duct (4) in complication with local empyema, vesicular rupture etc (5) in recurrent cases (6) in cases of chronic icterus by common duct obstruction within certain limitations, however (7) in cases where the diagnosis is obscure and exploratory cholecystotomy is desirable.

The indications for cholecystostomy are (1) when the gall bladder is relatively healthy and the cystic duct permeable (2) in cases of empyema and angiolobitis if the passages are permeable (3)

when the gall-bladder is much inflamed and adherent and the patient unsuited for a radical operation.

Indications for cholecystectomy are (1) when the gall bladder is the site of severe inflammations and is adherent contracted and the mucosa ulcerated (2) when the gall bladder is contracted upon calculus and the cystic duct obstructed (3) in certain cases especially in order to cure an external fistula (4) in association with choledochostomy or hepatoctomy when imperative.

Choledochotomy and cholecystostomy are indicated (1) when the calculus is retained incision of the common duct extraction of calculus, catgut suture in two planes, cholecystostomy for drainage; (2) when the gall bladder is much contracted and adherent cystic duct obstructed and a calculus in the common duct.

W. A. BRIDGES.

Deramond. Prolapsed Spleen with Torsion of Pedicle for Ten Months. (Rat prolapsé vrc tcr na d pedi vrc lepus di mois) *Rev. gén. de l'id. ther. p. 96* 1908.

The author reports the case of a woman of 35 who showed symptoms of an abdominal tumor the diagnosis of which was uncertain. Vomiting, intense ventral pains and loss of consciousness had been intermittently present for ten months. On making a laparotomy the author found subjacent to a greatly thickened and adherent epiploon an enormous spleen, weighing 400 grams, presenting by its convex face. The under surface was turned up with difficulty on account of its adhesions with the small intestine, uterus, etc. and pedicle was found the size of the femoral artery.

The pedicle was completely obliterated for 18 centimeters. The author resected the whole mass and the patient recovered without incident.

The author calls attention to the fact that the organ has apparently been subjected to torsion for a period of ten months without being attacked by gangrene giving rise to any symptoms of peritonitis.

W. A. BRIDGES.

Miller J. L. Splenectomy in Splenic Anemia, Hemolytic Icterus and Hanot's Cirrhosis. *J. Am. Med. Ass.* 90 April 7.

In hemolytic icterus bile is usually present in the blood but there is no urobilin while in the urine bile is absent except during hemolytic crises, but urobilin is present. This peculiar condition is not present in either of the other two diseases.

Secondary anemia of greater or less degree is characteristic of splenic anemia and hemolytic icterus, but is not present in Hanot's cirrhosis.

Urobilin in the stool usually considered as an index of blood destruction is greatly increased in hemolytic icterus. Eppinger believes that the amount present in the normal stool is from 0.5 to 1.5 gm.

While in three patients with hemolytic icterus the amount varied from 5 to 38 gm.

In these three conditions, which are in many ways

so closely related it is at present impossible to explain why in Hanot's cirrhosis there is icterus with out anemia in splenic anemia there is anemia without icterus, and in hemolytic icterus there are both icterus and anemia although in many instances icterus is the dominant condition.

The classification of all splenic tumors with chronic anemia under the general head of splenic anemia may not be logical but from a therapeutic point of view such a grouping may be desirable as there is indisputable evidence that cure has been effected in the vast majority of patients clinically diagnosed as having splenic anemia on whom splenectomy was performed. Even when the disease has advanced to the point of marked hepatic cirrhosis and ascites more or less complete return to normal has been reported.

The results of operative measures in the early stage of the disease are excellent. Griffin from the Mayo Clinic reports the cases of five patients three with cirrhosis and ascites, and two in the preascitic stage of cirrhosis, on whom splenectomy was performed and four of the five returned to normal health. One of these patients with ascites has been well seven years. In the Mayo series of eighteen patients two died or 11 per cent. Twelve of the sixteen recovering from the operation are now in excellent health (1915) two are definitely improved one at first improved later developed ascites and died and one died two years after the operation the cause of death not being determined.

Appearing either as an acquired or familial condition the first symptoms of hemolytic icterus may develop either at birth or during early adult life. The characteristic symptoms outside of its familial nature are the chronic icterus of fluctuating intensity combined as a rule with varying degrees of anemia greatly enlarged spleen often moderately enlarged liver urobilin in the urine, but no bile except in some instances after a hemolytic crisis the stools well colored with no evidence of biliary intoxication as pruritis and bradycardia and the presence usually of a lowered resistance of the red corpuscles. The disturbed resistance of the erythrocyte which has been considered so characteristic of this condition is not always present.

The usual presence of lowered resistance of the erythrocytes and the relation of the spleen to this phenomenon stamp hemolytic icterus as having a probable etiologic relation to the spleen. It might be considered that as the normal spleen tends to lower the resistance of the erythrocyte to hemolytic agents an enlarged or hyperfunctioning spleen might increase this tendency to such a degree that hemolysis would occur from a variety of mildly hemolytic agents normally present.

Splenectomy is undoubtedly curative. The operative mortality in forty-eight cases was only 4.1 per cent. The forty-six patients who recovered from the operation were cured. The jaundice rapidly disappeared beginning within a few days and as a rule being complete within two weeks.

The recovery from the anemia was somewhat slower but relatively rapid.

True Hanot's cirrhosis is rare and bears some resemblance to splenic anemia and hemolytic icterus. It would appear probable, however that in Hanot's cirrhosis a condition which has heretofore been considered incurable, splenectomy was indicated.

C. G. HLYD

Lee, R. I. Minot, G. R. and Vincent B.: *Splenectomy in Pernicious Anemia Studies on Bone-Marrow Stimulation.* *J. Am. M. Ass.* 1916 lxxv 719

The authors report fifteen cases which include all the patients with pernicious anemia operated on by splenectomy at the Massachusetts General Hospital from November 1914 to May 1916. One patient with a red count below 1,000,000 died the day after operation presumably of postoperative shock. There were no other immediate postoperative deaths thus giving an immediate operative mortality of 6.6 per cent. Of the patients who survived one case was too recent to afford any data. Of the remaining 13 patients one operated upon two and a half months ago is still in the hospital on account of thrombosis. The other 12 left the hospital three to six weeks after operation at which time the large majority presented no great change in their blood counts although they all felt better looked better and were less yellow. Four patients showed considerable immediate and progressive improvement in the red counts and hemoglobin. The condition of these 13 patients was ascertained as far as possible two months after operation. 3 had not changed materially one case showed a slight increase and one a moderate increase in the red cells, 8 showed a marked increase in the count of red cells. The red counts of these 8 cases average approximately 4,000,000 cells with a general improvement in their clinical condition. In these cases it was noteworthy that the diagnosis of pernicious anemia could still be made from the blood films.

Of the 13 patients there were 10 in whom six months had elapsed since operation. At the end of six months 5 of these patients had a relapse. Of these 5 at the two months period 4 had presented very marked improvement. The fifth patient never showed any great improvement.

At the end of a year after operation no information could be obtained concerning 2 patients. These 2 patients however had had no relapse within six months. Of the 5 remaining patients only one had gone a year without relapse. This patient however suffered a typical relapse and died sixteen months after splenectomy. One of the remaining 4 died sixteen months after operation in a second relapse. Another after sixteen months is now having a very serious relapse after several minor relapses and still another is in his second serious relapse at the end of the year period.

The end results of splenectomy in the authors

opinions certainly fail to show any permanent results from this procedure. They observe that the eventual progress of the disease is not changed. Nevertheless it is a striking observation that in 8 out of 13 cases there was considerable temporary improvement in two months which persisted in some of the cases up to six months. This improvement was marked, though not necessarily more marked than the improvement often seen occurring spontaneously but it seemed to occur rather uniformly after splenectomy.

Observations on the blood element were as follows. Immediately after splenectomy there was a leucocytosis varying from 9,000 to 35,000 with an increased polymuclear percentage. This occurred within twenty-four hours after splenectomy and subsided within a few days. The authors found that persistently after splenectomy there was a distinct tendency to a higher level of the white count than occurred in the usual course of pernicious anemia. The increase was both lymphocytic and polymorphonuclear. The polymorphonuclear cells when increased tended to give a normal trieth picture. Patients with the highest leucocytosis tended to show the greatest improvement after splenectomy and offered a rough means of estimating the future reaction of the red cell forming part of the bone marrow. Such figures suggest to the authors that a persistently low polymorphonuclear count in pernicious anemia is of value as one of the indicators of bone marrow exhaustion. Like the leucocyte count the number of platelets in general followed the curve of the red cells. The platelets showed a definite increase three to seven days after splenectomy. This increase usually takes the platelets above the normal as in one of the authors' cases to 900,000. The authors were impressed by the association of the increase of platelets and thrombosis. Thrombosis or phlebitis was noted in 3 of their cases and they are inclined to believe that the thrombosis is in some way related to the marked increase of platelets.

Howell Jolly bodies occurred constantly in every case after operation. These bodies usually appeared in small numbers the day after splenectomy and gradually increased. In some instances 25 per cent of the red cells contained them. The usual percentage was from 2 to 10 and the percentage fluctuated. The authors are inclined to believe that these bodies are related to an increase of bone-marrow activity or to irritation.

Of 11 cases, 10 showed a shower of blasts of varying degree a few days after operation. The findings were not constant and their presence was in considerable numbers at any stage of the disease including after splenectomy is not considered of much significance as to the future course of the disease.

The percentage of reticulated red cells is taken as a measure of hemopoietic activity of the bone marrow. Under normal conditions about 0.8 per cent of the red cells are reticulated. In the spontaneous course of pernicious anemia wide fluctuations

in the percentage of these cells are observed. A high percentage of reticulated cells probably indicates an increased activity on the part of the bone marrow that produces red cells.

In general two to five days after splenectomy in pernicious anemia the authors have found a slight temporary rise in the reticulated cells. The temporary improvement in pernicious anemia after splenectomy is attributed to two factors: (1) an associated diminution in the blood destruction; (2) an associated increase in activity of the bone marrow (certain stimulating effects after splenectomy are seen almost immediately as in the case of the increase in the polymorphonuclear leucocytes). The increase in the platelets tends to occur somewhat later and the main increase of the reticulated cells when it does occur seems to be inaugurated still later. The authors conclude that the stimulation of the bone marrow is usually associated with improvement whether after transfusion or after splenectomy. Splenectomy seems to result in the greatest stimulation of the bone marrow of any known therapeutic measure. It is on the whole bone marrow and not only on the portion that forms red cells. However splenectomy does not alter the essential course of the disease. While more constant stimulating effects are seen after splenectomy in any individual case of bone marrow stimulation after splenectomy may be roughly paralleled with a case of bone marrow stimulation that occurred either spontaneously or after transfusion.

It is evident that from splenectomy one can attain stimulation but once. Transfusion, while perhaps less constant and of less active effect, has two great advantages. It is relatively simple and can be repeated a number of times. Transfusion does not modify the destructive agencies at work in pernicious anemia. C. G. HENR

McClure R. D. Pernicious Anemia Treated by Splenectomy and Systematic, Often Repeated Transfusion of Blood; Transfusion in Benzol Poisoning. *J Am Med Ass* 96 April 29, 1933

McClure briefly reviews the history of blood transfusion in pernicious anemia citing four cases, one due to benzol poisoning.

Since 1666 when transfusion of blood was first tried by Jean Baptiste Denys until the present date this procedure has been tried innumerable times, but with only indifferent results. Lack of systematic treatment and care in selecting the proper dose or are the chief reasons for failure. In 1870 Sandoz discovered that all blood could not be used and in 1900, Mow and Janaky found that the red cells of one individual may be clumped by the serum of the other that these cells may be hemolyzed and that human beings are divided into four classes by these facts. Therefore the selection of the donor is of most importance not only to prevent agglutination and hemolysis but also the transmission of certain diseases dormant in the blood i.e. syphilis and malaria.

A case of benzol poisoning is cited the symptoms being those of a severe purpura hemorrhagica with an anemia of the aplastic type. Repeated transfusions resulted in a complete cure.

Following this case the method was applied to seventeen cases of pernicious anemia with the following results

| TABLE — RESULT NINETEEN ANEMIA, NO DEATHS. | TRANSFUSIONS IN SEVENTEEN CASES SIXTY-FOUR TRANSFUSIONS BEFORE DEAD WITH | PER CENT |
|--|--|-------------|
| Result | Number | Per Cent |
| Beneficial: | 34 | 53 |
| N. benefit | 43 | 45 |
| Harmful | 7 | |
| Severe reactions | 7 | |
| Slight reactions | | 0 |
| Chill | 7 | 0 |
| Delayed heart 24 hours after transfusion | | 1/4 |
| Jaundiced | | 1/4 |
| Hemoglobinuria | 3 | 4 1/4 |
| Temp. elevation over | | 0 |
| Skin eruptions | 7 | |

*Splenectomy was performed in six cases.

The results in this series have been so encouraging that the author feels that life may be indefinitely prolonged where this systematic transfusion of blood is used in conjunction with splenectomy the number of transfusions depending upon the hemoglobin reaction 75 per cent being the lowest and 90 per cent the highest consistent with good results

P. M. CHASE.

Krumbhaar E. B. Late Results of Splenectomy in Pernicious Anemia *J Am M Ass* 1906 lxvii, 723

It is interesting to note that Eppinger was led to adopt this procedure by observing after splenectomy a diminished output of urobilin and other evidences of decreased hemolysis. Decastello on the other hand had noted the improvement that followed splenectomy in the related conditions hemolytic jaundice and Banti's disease whereas Klemperer was influenced by the clinical observation that splenectomy for such conditions as rupture of the spleen was in some instances eventually followed by polycythemia.

Of the 153 patients studied, 106 per cent died within six weeks a distinct improvement in the clinical condition and in the blood picture occurred in 64.7 per cent and no improvement in 15.7 per cent.

The rather high postoperative mortality—practically 20 per cent—may be due to a poor choice of cases in the early series. As a much greater proportion of the more recent cases have survived the operation, the true postoperative mortality is probably much less than 20 per cent.

Of the individuals who showed improvement shortly after operation nearly two-thirds of the total number a large number have failed to maintain this improvement or have since died in a relapse or from intercurrent disease.

Although a few cases have continued in good condition during the period of observation (over two years) in no case can it be said that a cure has

been effected and the blood of these individuals continues to show many of the characteristic signs of pernicious anemia.

On account of the improvement that follows splenectomy it would appear to be not only a justifiable but in many cases an advisable procedure but in no case should a cure be promised or the operation undertaken except under the most favorable conditions.

The best results are obtained if the operation is preceded by one or more transfusions and those patients who relapse after operation will be greatly helped by transfusion. Whether or not transfusions would have produced equally good results in the absence of splenectomy is a question that cannot at present be decided.

The most favorable results may be expected in individuals who have not passed the fifth decade in whom the disease has not progressed for more than a year and who have a relatively good blood picture that is an anemia that is not of too extreme a degree or of the steady progressive type. Individuals with enlarged spleens have done better than those in whom the spleen was small or of normal size, as have also those suffering from an anemia characterized by excessive hemolysis.

The opposite of these conditions should be considered as unfavorable factors, as should also the existence of spinal cord symptoms or the presence of an aplastic bone-marrow

C. G. HAYD

Peck C. H. Splenectomy for Hemolytic Jaundice *J Am M Ass* 1916 lxvii, 788

In reporting three cases Peck reviews the subject of splenectomy for hemolytic jaundice.

The accumulating evidence of the results of splenectomy has proved the etiologic relation of the spleen changes to the disease although the exact nature of the process is more or less obscure. The presence of bile in the urine indicates complicating disease of the biliary tract.

Hemolytic jaundice is of two types (1) congenital which is usually of the familial type and (2) acquired. The symptoms of both are practically identical however.

A detailed account is given of a case of the congenital type but non familial. After two operations for supposed biliary obstruction the diagnosis of hemolytic jaundice was made and splenectomy performed, with immediate disappearance of the jaundice and lasting improvement in the blood picture. The case presented marked fragility of the red cells, no itching slowing of the pulse or presence of bile in the urine. There was moderate splenomegaly and anemia with increase in the number of reticulated red cells urobilin and urobilinogen were also present in the urine.

The second case was of the acquired type with symptoms similar to the first, but not so marked as the disease was of short duration. Splenectomy was followed by prompt and complete return of health.

The third case was of the same type as the first, with symptoms not so marked. Splenectomy likewise resulted in complete cure.

Peck states in conclusion that hemolytic jaundice is not uncommon and that it can be cured by splenectomy.

P. M. CHASE.

Friedman G. A. and Katz, E. A Case of Acquired Hemolytic Jaundice with Splenectomy. *J Am Med Ass* 9 6 1 v. 295

The case is reported of a male aged 18 a tailor white born in southern Italy eighteen months in this country who first came under the observation of the Vanderbilt Clinic November 9 1915. There was no history of cterus in the family. He had been in good general health until eight months previous March 1915 when he noticed that his skin and eyes were rather rapidly becoming lemon colored. In about two days the jaundice was deep he felt drowsy was weak, and had to go to bed. On the third day he had high fever, sweat a good deal and had several distinct chills. The high fever with the severe chills and sweats persisted for two weeks, during which time he remained at home and in bed. The yellow discoloration of the skin and mucous membranes however which had by this time become less intense was nevertheless quite marked. At the beginning of the third week the fever sweats, and chills decreased in severity and the patient resumed his work at which he remained until his admission to the Roosevelt Hospital November 17 1915. During this entire period he had a daily temperature of from 99 to 100 which appeared regularly in the afternoon preceded by a slight chill lasting for about five minutes and followed by sweating. At no time did he have itching of the skin. For a few months prior to his admission to the hospital in addition to the symptoms mentioned he complained of a heavy feeling distention and tenderness in the epigastrium. These appeared about half an hour after meals and continued from ten to twenty minutes.

When examined his pulse was 75 respiration 8 and temperature 100. His nutrition was fair. The skin and visible mucous membranes were distinctly icteric and there was a slight acne rash on the back of the chest. The tongue teeth pharynx, tonsils, and eyes were normal. The heart and lungs were negative. The abdomen was relaxed and there was slight tenderness in the epigastric region especially to the left of the midline. The liver was not palpable and on percussion, did not seem to be enlarged. The spleen however was distinctly enlarged the sharp inner border being felt near the midline and reaching almost to the umbilicus, the lower pole being 4 inches above the crest of the ilium. The consistency was about normal the surface smooth and not tender. The genitalia extemities, and reflexes were normal.

November 9 1915 the blood examination showed hemoglobin 68 per cent, erythrocytes 4,500,000 and leucocytes 4,200. Slight polycythemia was

present and the crenation of the red blood-cells was marked. No pigmented or other abnormal erythrocytes were found. Blood withdrawn for the Wassermann reaction also gave negative results, but tests for bilirubin in the blood serum were strongly positive.

Although roentgenotherapy was considered, a splenectomy was advised. This was done November 23 1915. Under ether anesthesia an incision was made along the left border of the left rectus muscle from the rib margin to the umbilicus. Palpation of the gall bladder gall-ducts, liver stomach and pancreas was negative. The spleen was markedly enlarged firm but not indurated, and free from adhesions except along its posterior border and to a moderate extent at the upper pole. The adhesions were freed allowing the delivery of the spleen forward. The pedicle of the spleen was then ligated and the spleen removed. It weighed 800 gm. The wound was then closed in the usual manner. The operation was well borne and the patient made an uneventful recovery. It is not resting to note that the icterus began to disappear immediately after the operation and was almost entirely gone at the end of a week. Four weeks later the patient resumed his work.

The results obtained by the splenectomy were striking. Two days after the operation, November 25 the white blood-cells rose to 24,000. The polymorphonuclear leucocytes were 80 per cent. November 29 hemoglobin 83 per cent red cells 5,300,000 the color index being 0.9 total number of leucocytes 11,000. December 20 about one month later the blood count showed hemoglobin 80 per cent the total count of red cells being 5,440,000. The white blood-cells numbered 18,600.

The patient when last seen March 20 1916, had no subjective symptoms and there was no sign of cterus. The blood and urine were normal.

EDWARD L. CORRELL.

Lockwood C. D. Surgical Treatment of Bant's Disease. *Texas Med J* 417 St Paul, 9 6 Dec.

Splenectomy has become a well recognized procedure. A sufficient number of splenectomies have now been performed to establish upon a fairly secure basis the indications for this operation.

The author's contribution is based upon a careful review of the literature and observations in three cases. A brief description of the technique employed is given. A long rectus incision was found entirely adequate for the removal of all three spleens although two of them were very large. Special emphasis is laid upon the importance of ligating the splenic artery before removing the spleen. The spleen was delivered by encircling it with the arm much as one would pick up a large watermelon.

In two of the three cases reported a large amount of blood was lost from the spleen after its removal. This blood was collected in a sterile basin. It was then citrated and reintroduced into the patient's veins with marked beneficial results. This method

of autotransfusion was thought to be original, but on looking up the literature it was found that Lichtenstein had reported several cases of autotransfusion in ruptured extra uterine pregnancy.

The author then reports in detail 3 cases of his own and reviews 30 cases collected from the literature which have been reported since 1908. These 43 cases show an operative mortality of 14.5 per cent as against 19.5 per cent in 61 cases collected by Dr. George B. Johnstone prior to 1908.

MISCELLANEOUS

Franchini A.: Subphrenic Abscess (Dell' ascesso subfrenico). *Gazz. d. osp. e d. cl.* Milano 1916 xxxvii, 1074.

The author reports six cases of subphrenic abscess which he operated upon, three of which are ascribed to a gastric or duodenal origin and three to suppurative hydatid cyst.

The clinical variety of subphrenic abscess having a gastric or duodenal origin is that most frequently met with and its symptomatology is so characteristic that diagnosis is relatively easy. The onset is rarely insidious and is secondary to perigastritis or duodenitis following inflammatory neoplastic or ulcerous processes. As a rule objective manifestations of subphrenic collections with perforations are situated on the left side, but in the author's cases they were on the opposite side probably due to the primary lesion being situated in the pylorus or duodenum. It is very difficult to determine the exact anatomic point at which perforation occurs. In the author's cases he decided that this was not in the anterior face of the pylorus or duodenum because in such an event a generalized peritonitis would have ensued. When on the other hand the perforation is on the retropyloric or posterior duodenum, the acute inflammatory process finds the anatomical conditions very favorably disposed as a barrier of defence against diffusion into the peritoneal cavity.

As regards the cases of suppurative hydatid cysts the author is doubtful if these should be regarded as true subphrenic abscesses, as he prefers to restrict that term to pus collections. When cysts of this kind give rise to subdiaphragmatic abscesses, which is rare, they should erupt in the interhepatic subdiaphragmatic space, but in his cases the author found himself unable to verify this rupture.

With regard to the operative treatment of subphrenic abscesses this must be subordinate to the situation of the abscess. There are cases in which a clear epigastric or lumbar evolution does not permit any doubt as to the procedure to adopt. Where the case has a clearly thoracic development the transpleurodiaphragmatic route with resection of one or two ribs must be selected as guaranteeing the best outlet for the products of purulent secretions and avoiding the danger of peritoneal involvement. This route is considered better than the antero-abdominal route for cases of abscess of gastric origin

as it affords a better drainage. The incision can be posterior or lateral generally in the neighborhood of the ninth rib according to objective signs and the results of exploratory puncture. The length of the incision should vary from 15 to 16 cm. enough of the ninth and tenth ribs being resected to afford sufficiently low exit for secretion products.

The author does not consider that operative pneumothorax is a very serious danger and in any case it may usually be avoided or reduced. He has in all his cases used local anaesthesia (novocaine) and to this fact especially as well as to the post-operative care he ascribes the success which attended all six cases treated. These cases were exceptionally grave and Franchini is of the opinion that a different procedure would probably have resulted in some failures. W. A. BRENNAN

Selbert O. J.: Diaphragmatic Hernia. *Surg. Gynec. & Obst.* 916 xxi, 465

The author reports a case of diaphragmatic hernia of the stomach in a woman 68 years of age. The condition was apparently of congenital origin although four successive protracted labors may have had some part in exaggerating the condition. The patient has had more or less stomach trouble all her life. This has become progressively worse since her first confinement, 30 years ago and especially so in the last ten months. The clinical picture at this time was that of pyloric obstruction. Roentgenographic examination showed the entire stomach above the diaphragm, behind the heart. There was no respiratory embarrassment nor cardiac displacement which are usually found with diaphragmatic hernia.

At operation the stomach was found in the posterior mediastinum with the pylorus bound to the margin of the oesophageal opening which was sufficiently large to admit the entire hand. The stomach and pylorus were released and replaced into normal position the diaphragmatic opening closed with interrupted sutures and a ventral fixation done. The gastric symptoms have entirely disappeared since operation.

The report is illustrated with roentgenograms and drawings and there is a review of the literature on the subject which shows the extremely few cases recognized prior to autopsy and the still fewer cures effected, even though the condition is not nearly so rare as is usually supposed.

Pringle, J. H.: Report of a Case of Hernia Into the Paraduodenal Fossa. *Glasgow M. J.* 1916 lxxvi, 65

Pringle describes the paraduodenal fossa and reports the following case. A man 40 years of age previously well had had three attacks during the preceding year of severe pain in the epigastric area following the taking of food. He would vomit green bilious material and be unable to work for two weeks or more. He had lost considerable weight and was emaciated. The upper abdomen was

rather full, with a palpable tumor in the left lower epigastric region. There was no free hydrochloric acid in the gastric contents. At operation two masses were found the larger being behind the stomach and pushing it forward splitting the gastrocolic ligament longitudinally.

The tumor was about the size of an average Spanish melon, and adhesions were present everywhere. The sac opening could not be located so the sac was opened and found to contain the small intestine with numerous large tuberculous glands contained in its mesentery. The ring of the sac was finally found in contact with the caecum pointing downward and backward and the anterior boundary of the ring contained the inferior mesenteric vein. After the small intestine and a part of the gland tumor were reduced the ring was in the middle line and over the lumbar vertebrae. The ring of the sac could not be closed up as part of the tumor and adherent jejunum could not be reduced. To prevent recurrence of the hernia the jejunum was sutured to the posterior surface of the stomach just outside the ring together with a few sutures placed through the anterior wall of the sac and the retained jejunum on the left side of the vein. As the duodenum was greatly dilated and hypertrophied an anterior gastro-enterostomy with an entero-enterostomy between the afferent and efferent loops of the bowel was made. Posterior gastro-enterostomy was not possible because of adhesions. The openings in the sac and gastrocolic ligament were sutured and the abdomen closed. The patient made a good recovery gained considerable weight and was in good health sixteen months after the operation.

The points of interest are the great stretching of the sac and the displaced orifice down to the right iliac fossa, the dense adhesions between the ring and the terminal ileum and the inextensible tumor. The adhesions everywhere present were probably due to the tuberculous process and Pringle thinks produced the hernia itself. (CARL R. STEINKE.)

Webb, C. H. S. and Milligan, E. T. C. Thirty-two Cases of Penetrating Wounds of the Abdomen. *Brit J Surg* 19 6, 1 335.

The series consists of 32 cases, 21 of which were submitted to operation, and 11 of which were not operated upon. Those not operated upon fall into two groups: () those where there was doubt as to the penetration () those cases that were moribund or too hopelessly sick to admit of laparotomy.

Of the cases not operated upon, 6 recovered and 5 died, giving a mortality of 45.45 per cent and a recovery rate of 54.54 per cent. Of the cases that were submitted to operation 1 recovered and 9 died, giving a mortality of 48.85 per cent and a recovery rate of 57.14 per cent.

The authors have experienced considerable difficulty in deciding when to operate and have come to the conclusion that it is better in every case to wait until one to three hours after receiving the

patient before deciding to operate. They base their conclusions on the following reasons:

1. Antishock measures will differentiate between the moribund cases and those that are capable of reaction. This may seem a truism but it is an important one. The authors have found that time spent in operating on those cases which do not respond to antishock measures on admission to the casualty clearing station is time wasted. They have not saved any case by rapidly opening the abdomen, expecting perhaps to find bleeding from a large vessel and ligating the same. Moribund cases are very pale, have small rapid pulses, and present a picture of severe internal bleeding whereas in reality they are usually severe cases of shock, superimposed upon an almost negligible amount of bleeding. Cases of wounds of large vessels do not reach the average casualty clearing station. Unless patients can be treated over their shock it is useless to try any operative measures.

2. Waiting will help one to decide whether actual penetration has occurred or not. That is to say, a patient brought in by motor ambulance, suffering from a wound of the abdominal wall, will often complain of severe abdominal pain with tenderness and rigidity and around the musculature wounded, he may even have vomited but rest in bed will quickly clear up the diagnosis. Again, where the liver the diaphragm and perhaps one kidney or the other have been wounded, it is very difficult at first to be sure that there is no lesion of a hollow viscus also present. Rest in bed brings to light the progressive symptom-complex of a peritoneal infection whereas the false impression of grave intra-abdominal injury, treated in the mind of the observer, by many cases of simple wounds of the abdominal wall, or of the solid viscera unaccompanied by severe hemorrhage is dispelled as with each hour of rest in bed the patient becomes more and more comfortable and at ease.

In the examination the face—pallor, anxious expression, sinking of the yea—is of the utmost help in arriving at an estimation of the general condition of the patient and in addition, working of the alar nasi, combined with other evidences of dyspnea, in wounds of the upper abdomen where the diaphragm is involved, is also useful.

The pulse is perhaps the most reliable guide of all. A steadily rising pulse is more to be relied upon as a determinant for operation than any other symptom or sign. The general character of the pulse naturally is of great value in deciding whether or not an operation is possible.

Respiratory vary mainly with the situation of the abdominal wound, and also to some extent with the damage wrought by the projectile. In an uncomplicated wound of the small intestine, without much bleeding the respirations may not vary from the normal at all. A wound involving the diaphragm produces shallow, catchy, spasmodic breathing at a quickened rate, often 40 per minute. Where there is much bleeding the finger becomes noticeable.

With a commencing peritonitis, again the rate quickens and the respirations become shallow and thoracic in type.

Temperature is no guide at all in the early stages. In a great many cases on admission the temperature is subnormal. It is very seldom indeed that a temperature of over 99 degrees is registered before the case has been some hours in bed. The degree to which the temperature is subnormal is a guide to the amount of shock present. A subnormal temperature and a pulse of over 140 are grave signs. If after an hour in bed such a pulse continued to rise and remained small and unsteady and the temperature remained subnormal or even fell further, we would not attempt any operative measures.

Vomiting as a positive sign is useful as confirmatory evidence, but its entire absence has been noted in cases where either at operation or at an autopsy the presence of extensive intra abdominal injury has been ascertained. Patients with wounds of the abdominal wall not infrequently vomit and those with simple bullet wounds of such viscera as the liver and kidney may or may not vomit.

The escape of urine, intestinal contents, or bile, or the prolapse of omentum, intestine, or (as in one case) liver through some other wound is of course pathognomonic.

Tenderness and rigidity are in nearly every case present and marked. The same remark as to localization made with regard to abdominal pain applies here also with the reservation in both cases that muscular rigidity may be of more help than pain in localizing some cases, especially where a through-and-through wound from front to back has occurred toward the periphery of the abdomen. General rigidity is an important sign of some intra abdominal lesion.

The authors have followed a definite detailed method of examination of the abdominal viscera. The ileocecal junction is sought for and the ileum is traced in continuity backward to the duodenojejunal flexure. The ileum and mesentery are examined back and front during this procedure and each loop of intestine is drawn serially out of the abdomen.

Each intestinal wound as discovered is covered in by a gauze sponge around the whole circumference of the gut and held in place by a clamp. The cecum ascending transverse, and descending colons are then examined, special care being necessary at the hepatic and splenic flexures.

No remedial measures with the exception of temporary haemostasis are commenced until the whole number and character of the lesions present have been ascertained.

The authors believe that it is very important to make a thorough attempt to find the projectile in

every case in which it is retained. Clothing carried in will be found mostly clinging to the ragged portion of shell causing the wound.

The peritoneum is cleansed along the tract as far as possible by gentle dry swabbing. Drainage tubes are inserted along the tract through the parietes.

As to complications following operation more cases were lost from shock after operation than from any other cause.

There were two cases of acute dilatation of the stomach which reacted well to eserine gr 1/50 combined with gastric lavage.

Distention has been most marked in cases of wounds of the terminal ileum and of the cecum. Eserine one half gr doses of calomel and small enemata have been useful.

Unfortunately respiratory sequelae have been only too frequent taking the form of bronchitis or a bronchopneumonia.

A spreading cellulitis of the abdominal wall commencing in the projectile track is not an uncommon sequela.

A fatal result from gas gangrene toxemia, starting round a retained missile has been responsible for several disappointments.

The retroperitoneal tissues are easily and rapidly affected by organisms which happen to be implanted therein. C G Hryn

Récamier and Luyzier. Accidents Due to Abdominal Contusions (Accidents des contusions de l'abdomen). *Presse méd* 916 p 449.

In addition to immediate grave results of abdominal contusions resulting in visceral rupture, etc the authors point out that there are often other local effects which have a special symptomatology.

The symptoms consist in pain at first sharp but becoming dull and persistent, in the left hypochondrial region and a fluctuating tumor making a considerable projection is observed developing under the left costal border.

In one case the authors approached the tumor by the lumbar route. On exposing the lower pole of the kidney they opened a large cavity containing 15 liters of serosanguinous fluid. The man recovered but with a fistula. In the second case the transperitoneal route was used, the peritoneum was healthy, the tumor being strictly limited in front of the epiploon but extending up to the kidney and enclosing serosanguinous fluid as in the first case. In this case as there was a kidney lesion a urinary fistula formed.

In similar cases the author thinks it best to use the lumbar route of approach to avoid any possible complications due to non-manifest kidney lesions.

W A BREXMAN

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Haines, W. D. Acute Osteomyelitis. *T. H. U. Surg. As. St. Paul* 9 6 Dec

The author believes that acute osteomyelitis should be placed in the category of emergent surgery. There are two conditions with which this disease is frequently confused, rheumatism and typhoid fever. As the bone infection usually begins in juxtaposition with the joint, rheumatism becomes a very natural and frequent stumbling block, but the deep-seated pain elicited by firm pressure over the shaft usually near the epiphysis, absence of effusion into the joint itself, and the sudden severe onset of symptoms serve to distinguish this disease from the arthritides.

The swelling and tenderness over the joint are present early and may precede pain in rheumatism, whereas joint involvement in osteomyelitis appears only after perforation has taken place.

In the differentiation of this condition from typhoid and other acute exanthemata there are numerous clinical data to guide us, but we should always be on the lookout for bone complications. The staphylococcus aureus is the most frequent bone infection, but bacillus typhosus, pneumococcus, and bacillus coli communis have been found as causal factors. Trauma exposure to cold hemorrhage, and other fever-relieving influences are predisposing factors in the production of the disease.

An interesting feature of this paper was the somewhat novel description of what the author was pleased to call the mechanics of osteomyelitis. It dealt with the arrest of infection in the terminal articular site, the end of the bone, and the method by which quickly wide destruction of the bone and surrounding structures followed in neglected cases.

He likened pus to steam in that it cannot be confined by pressure. Numerous case histories were cited to illustrate various phases of the paper. The grand theme of surgery, he said, well known to have the fatal phalanx of a patient suffering of whitlow by early free incision, but just why they left the further application of this cardinal principle in the treatment of osteomyelitis to those who were troubled with it is still a mystery.

Reference was made to the numerous specimens found in museums of sequestra reappearing along almost the entire shaft of some of the long bones, and the hope was expressed that with our present day understanding of the pathology and treatment of the disease conditions of the past would cease.

The disease rarely speaking runs a very acute course, recognition however of the chronic form of osteomyelitis is highly essential to a clear conception of the end results following fracture of

the bone as patients suffering from the chronic form of the disease are prone to show bony deformity, delayed union, no union, coxa vara, or overgrowth of bone, and if antecedent conditions are not recorded the surgeon is blamed for bad results for which he is in no way responsible.

Blaine, L. S. Idiopathic Infantile Osteopathy. *roids. Am. J. Roentgenol.* 9 6 Jul 438

While the name Idiopathic osteopathy was adopted by Lobstein in 1833, Blaine finds it to be unquestionably correct inasmuch as it indicates the pathology of the disease. Such names as I. agilitas ossium, osteogenesis imperfecta, perosis, dysplasia dysplasia, perosis, foetalis, myeloplastic malacia, and others do not define the condition, and in fact some entirely misrepresent the actual process.

Blaine divides the cases into three forms: (1) fetal osteopathy, (2) commonly allied osteogenesis imperfecta, (3) infantile osteopathy, and (4) adult osteopathy. He reports one case and although others come under his observation the records are lost. The point of interest in the diagnosis of this condition is the thinning of the shaft of the long bones where the multiple fracture usually occurs, the humerus bones and the ribs of the long bones are not likely to be involved.

W. S. NEWCOMB

Edington, C. H. Secondary Infections of Joints in Acute Medical Illnesses. *Bull. W. J.* 9 6, 29

Edington reports three cases of bronchopneumonia complicated by a pneumococcal abscess of the knee, one of empyema (pneumococci) with abscess (streptococci) and one of cerebrospinal fever with suppuration in the knee joint.

The author believes that the lowering of general resistance plays a part in the occurrence of joint involvement in the course of medical conditions, but he is unable to explain why certain joints are involved in none of the three cases reported was there an local cause or trauma discovered. The probabilities are that in most cases of secondary arthritis the condition is to be looked upon as a metastatic one.

F. D. DRAXSON

Bauer, F. A Case of Arthromyositis of the Vastus Internus Muscle (Ex. Fall von Arthromyositis in Muskelastus internus). *Z. XI. Verh. S. 5 C. 5* Goeteborg 9 6 July

The author describes a specimen of tumor excised from the vastus internus muscle and its tendon. From the clinical symptoms and the anatomical relations of the tumor—its firm location, its low rippling resting upon the patella, the contents after tapping—it was suspected that it belonged to the group of tumors described as arthromyositis by Bjoern

Floderus. The microscopic examination of the tumor corroborated this view.

A group of tumors formerly known under various names (ganglions synovial ganglions synovial cystomata) are according to Floderus histoid tumors of joints and he gives them the name arthromata to correspond to chondromata for histoid tumors of cartilage.

L. A. JONES.

FRACTURES AND DISLOCATIONS

Barney C. O. Observation on Fractures. *N. Y. St. J. Med.* 1916 xvi, 466

The author's observations are based on 116 cases. He states that every fracture is potentially a deformity and if it becomes a permanent deformity it will lead to impairment of function. The object of treatment is the restoration of complete function and the overcoming of the deformity with the least risk and inconvenience to the patient and the least anxiety to the surgeon. The author holds that the smooth working of a limb depends on preserving the true axis of the movements of the joints, so that the stress of muscular action may act across the joints in normal lines. Therefore in dealing with fractures of the shafts of long bones the first consideration is to secure and maintain a true anatomic alignment of the bones.

Barney states that surgeons with large experience in the manipulative methods of treating deformity will obtain better results than the novice and these surgeons will reserve the operative methods for those cases which show that after skillful manipulation they were unable to retain the parts in a correct position until union of the fragments had taken place.

The old traditional wooden board used as a splint is fast being abandoned. No human limb will fit a flat board. If the limb is bandaged tight enough to maintain immobility of the limb on a flat board splint the pressure will almost certainly cause pressure atrophy of the muscles. A joint that is tender to palpation is not ready for movement.

In the second part of the paper which is devoted to a consideration of special fractures the author mentions the use of thyroid extract as an aid to callus formation. For Colles fracture the author insists on the use of anesthesia. When reduction is complete no particular form of splint is insisted on. He has no fear of a stiff wrist where there is no injudicious passive motion applied. Other fracture treatments mentioned are along conventional conservative lines.

INDORE COMB

Owen W. B.: Intra articular Fractures. *Internal J. Surg.* 1916 xxi, 313

The author presents an interesting and instructive article on intra articular fractures. He states that solutions of osseous continuity involving intra articular surfaces having been recently encountered with comparative frequency induces the conclusion that many such lesions were formerly overlooked.

Radiographic examination prior to attempted reduction is necessary to determine the extent and character of the existing lesion and afterward to demonstrate whether the proper approximation of the fragments has been obtained and the likelihood of their remaining in fixed position until union occurs.

Intra articular fractures are susceptible of the same division and classification as solutions of osseous continuity elsewhere viz (1) simple (2) compound (3) comminuted and (4) accompanied by varying degrees of luxation. In the order of their frequency the occurrence of such fractures may be approximately stated as (1) at the elbow (2) the ankle (3) the wrist (4) the hip (5) the shoulder and (6) the knee.

External traumatic lesions constitute the principal causative factors, such as crushing or twisting of the wrist elbow and ankle less frequently of the knee hip and shoulder gunshot wounds may also be instrumental in the production of typical comminuted intra articular fractures.

As in the surgical management of fractures in other situations, the primary and essential prerequisites to ultimate successful results are (1) the avoidance of infection (2) the accurate approximation and maintenance of the fragments and (3) the prevention of disabling deformity.

All simple intra articular fractures which can be effectively reduced and the fragments maintained in correct anatomic apposition with fair prospects of future unimpaired function should be treated by the closed method supplemented by external application of proper supporting devices.

In the majority of fractures at the elbow joint placing the arm in extreme flexion has proved satisfactory. An exception to this must be made in lesions of the olecranon process the best result in that type being obtained by fixing the arm in full extension.

In the hip and shoulder joints if fracture occurs before insertion of the deltoid or psoas muscle, the limb may be dressed in abduction which will favor coaptation and maintenance of the fragments.

Fractures occurring about the wrist and ankle should be so dressed as to best maintain the fragments in accurate anatomic approximation.

When fracture implicates the knee joint the most favorable result may be secured by dressing the leg in moderate extension.

In compound and the majority of comminuted intra articular fractures, where the fragments can not be maintained in accurate anatomic apposition the open method must be employed if restoration of function is to be expected.

Drainage should be practiced in every compound fracture which invades the joint. As a precautionary measure in anticipation that infection by the bacillus tetani may have occurred the patient should receive an immunizing dose of antitetanic serum.

In extensively comminuted intra articular frac

tures, small fragments which cannot be maintained in correct anatomic apposition should be immediately removed.

In all joint fractures accurate coaptation and maintenance of reduction are imperative otherwise restoration of function cannot possibly be obtained.

The formation of an inordinate amount of callus in the joint usually means the ultimate production of partial or complete ankylosis. The limb remains practically fixed in the position in which it is placed when permanent dressings are applied. Some limitation of normal mobility and functional impairment may be expected in the majority of compound and comminuted intra-articular fractures, and the patient should be so informed before treatment is undertaken.

In advocating the open method of treating intra-articular fractures the importance of most rigid aseptic precautions is again emphasized. If the surroundings be such as to preclude the attainment of this desideratum the open method should not be employed. It is wiser to trust the ultimate outcome to nature with the closed method, than to subject the patient to almost certain infection and the consequent additional dangers to life.

In the production of fixation of joint fragments absorbable material is believed preferable but good results have been reported from the application of plates, screws, wires, and nails for this purpose. Certain operators have expressed a decided preference for autogenous bone-splints, ivory or bone pegs etc. and claim favorable results have been thus secured.

The after-treatment of intra-articular fracture differs in some respects from that applicable to solutions of osseous continuity in other situations. Hot applications and light massage may be advantageously employed earlier but passive motion should not be attempted until about the fourth week, and even then should be practiced with caution.

The conclusions are

1. The surgeon should be allowed ample time for thorough study of each intra-articular fracture before deciding upon the method of treatment. There is no need for haste in application of the permanent dressing nor in decision concerning operation. The same fracture will be present a week later.

2. Accurate anatomic approximation of the fragments is more essential in fractures involving joint structures than those in other situations to insure future restoration of function and joint mobility.

3. The method of treatment employed should be the one with which the surgeon is thoroughly familiar and which has been productive of the most satisfactory anatomic and functional results in his experience.

4. Exceptional precautions should be exercised in the production and maintenance of absolute surgical asepsis and aseptic operative technique.

5. Due caution should be observed by the surgeon to avoid additional traumatism to important

structures and to conserve normal blood and nerve supply so far as may be possible.

6. Despite the favorable results reported by other surgeons from the application of non-absorbable substances in fixing the fragments in intra-articular fractures, it is believed future experience will demonstrate that absorbable material is preferable.

Reincking II General Consideration in the Treatment of Fractures. IV *MS* 96 xv 45

Reincking believes that by early reduction of fractures, there is less swelling, less displacement and interlocking, less interposition of other tissue, and less prolonged injury to nerves and blood-vessels. Anesthesia and X-ray examination should be the rule in all fractures. Plaster casts are probably the best retentive appliance but in some instances instead of the circular casts the molded plaster splint may be used or bridging over of extensive injury by iron bars imbedded distally and proximally in plaster. Complicating injuries to vessels and nerves should be sought for. Passive motion should not be practiced in joint fractures until firm union has been established and acute sensitiveness disappears. For the ultimate mobility of a fractured joint is determined more by the extent of injury incurred by the joint structures and by the accuracy of the reposition and fixation of the fragments than by efforts to restrict blushing motion. The active exercise by the patient after firm union is the one essential requirement for the restoration of normal function. R. G. PACTAM.

Grant II H The Open Treatment of Fractures by a Simple Device. *T. South. Surg. & Gynec.* 33: Whit Sulphur Springs, 96 Dec

The author briefly discusses the indications for the open operation in certain fractures and urges the following steps. When in recent fractures of the femur, humerus, or tibia the X-ray shows approximation to be unallowably imperfect, also in all ununited fractures or in all cases of vicious union the seat of the fracture should be exposed, the fragments adjusted and fixation effected. The special device recommended consists of gimlets, with a screw shaft, used either as one or two pairs. The shafts are screwed into a drilled hole in the bone just above and below the point of separation, after the approximation has been made through an open wound. The handles of the gimlet, which are flat, are brought together and secured by a thumbcrew which holds firmly. If two pairs are used a plaster cast is not needed. When only one pair seems sufficient a light cast is applied after the wound is closed about the shafts. The clamps are removed after sixteen to twenty days. There is no reason to fear infection along the shaft. Eight cases are reported without failure to secure union.

Grant believes the following conclusions represent sound surgery

1 The advantage of directing the adjustment and fixation of the fragments in most fractures of the thigh and the humeral shaft as well as of the tibia and other long bones under the eye is often so positive as to require only a safe and simple method for general adoption.

2 Badly opposed as well as ununited fractures conditions readily recognized by modern facilities demand undelayed treatment by the open plan.

3 The application of absorbable ligatures requires as much or more manipulation as does the putting in of plates with far less security hence the risk is not compensated for and wiring of the fragments gives poor fixation with the drawback of a retained foreign body.

4 While the Lane plates in skilled hands accomplish perhaps the best fixation the method carries with it the serious objection of the danger of infection and even where all seems to go well, later removal is often required.

5 If by a simple inexpensive and safe method of fixation not even involving the broken surfaces approximation can be maintained open treatment should become the ideal method.

Cheever D: Some Aspects of the Treatment of Compound Fractures Under Civil and Military Conditions. Boston M & S J 96 clxxv 443

The author believes much good will come from the knowledge gained by surgeons of the warring nations. The care of wounds in civil and military fields is discussed in a general way. The author does not believe that internal fixation by means of bone plates etc. in infected wounds of compound fractures are contra indicated. The varying effects of projectiles at different speeds together with clothing and soil contaminations are discussed. Hypochlorous acid has been used with good results and is especially recommended because of its harmlessness. It having been given intravenously. During acute infections the use of plaster of Paris is not recommended the author preferring splints, etc.

H. W. MEYERDINO

Darrach W: The Importance of Early Reduction of Fractures with Displacement. Boston. M & S J 1916 clxx 437

The author makes a strong plea for early reduction of fractures believing that fractures should be classed as emergencies just as much as ruptured ulcer and acute appendicitis. Further the X ray plant an indispensable aid should be ever ready day or night Sundays and holidays. He believes many of the open operations could be avoided if proper attempts were made the day of the fracture.

His conclusions are as follows

1 A more exact replacement can be accomplished in the first few hours than if the reduction be delayed especially if that delay be a matter of days.

2 The percentage of perfect anatomical results will be much higher with early reduction.

3 The ease of reduction will to a large extent vary inversely with the time elapsing since the injury.

4 The additional trauma caused by manipulations during reduction will be reduced.

5 The evil effects of pressure of a displaced fragment on adjacent structures will depend on the duration as well as the amount of that pressure.

6 With a more perfect reduction comes a decrease in the amount of new tissue necessary to repair the injury which means a lessening of the period of disability and a more complete return of function.

7 Lastly the amount of pain and discomfort subsequent to the reduction will be lessened.

H. W. MEYERDINO

Dyck, F G: Treatment of Fracture by Nail Extension. Surg Gynec & Obst 916 xciii 478

The method is a compromise between the frequently inefficient closed method and the hazardous open operation and was proposed by Steinmann who got his idea from the Malgaigne books. Steinmann's explanation of the method is that it exerts a continuous traction exclusively by the aid of nails or screws which are driven either in or through the bone whenever possible through the lower fragment. Various modifications of nails and screws together with methods for introducing them have been used but the simple steel wire nail driven through the bone by a mallet is as good as any. Careful asepsis is of course necessary. The originator of the method treated a number of his cases by local anesthesia. This was not attempted in the author's work. The nail may be used both for traction and as a lever when rotation has occurred. On account of the great traction exerted it is necessary to have frequent X ray examinations lest a separation of the fragments take place. The optimum time for leaving the nail *in situ* is eighteen to twenty-one days. Traction applied for a longer period may cause the nail to cut through the bone by means of a pressure necrosis. The advantages of the method are

1 It is less dangerous than the radical open operation.

2 It enables the surgeon to exert the maximum amount of traction while using the minimum area for the attachment of the traction apparatus.

3 It will bring about a reduction of the deformity in old standing cases where other methods fail.

4 The technique is not difficult and can be mastered easily. Therefore the method is practical and can be used by the entire profession.

5 It gives access to wounds in compound fractures permits of frequent dressings and does away with unclean and infectious fixation apparatus.

Clough F E: Fractures of the Leg. End Results in One Hundred Consecutive Cases. J. Lancet 916 xxxvi 509

The report is based on Clough's experience in a mining district. The ages in 2 per cent of the cases

were between 20 and 40 years old. The average period of disability for all cases was 93.6 days. Conservative methods were followed as far as possible in handling the cases. Only 4 per cent were operated upon for the fracture alone. Some of the compound fractures which were infected united while suppuration was going on and Clough is strongly of the opinion that if repeated efforts are made the majority of recent fractures of the leg can be put into line and held there by conservative methods. He is also of the opinion that it requires as much experience and even more attention to details to handle fractures by the conservative method as with treatment by the open method.

Huntington states that the majority of delayed unions are due to faulty handling of recent fractures. The majority of the above cases were reduced under anesthesia. Almost without exception the men have returned to the same type of work they were engaged in prior to the injury. Tetanus has never been noted as a complication of fractures in over 30,000 accident cases treated by the author. He therefore does not use serum as a prophylactic agent.

FAMOUS CURS

Vaughan G. T. Treatment of Fractures of the Femur Especially in the Old. *J. S. Med. Surg. & Gynec. Ass. White Sulphur Springs*, 9, 6 Dec.

Vaughan believes that the most common cause of death after fracture of the femur is thrombosis with embolism—either from blood-clot or from fat.

He does not believe in operating on every case of fracture of the femur or in putting foreign material in the tissues when operation is performed except when necessary. For neck fractures with impaction and good position, plaster of Paris is applied with the limb in normal extension with displacement of fragments, Whitman a extreme abduction and plaster. If this treatment fails to effect reduction open operation and use of a screw or other means should be considered.

For shaft fractures when Bucks and other methods of extension are not indicated and open operation is decided upon, several methods may be used preferably exposure of the fragments and their coaptation in such a way as to maintain their position simply by an external splint. In oblique fractures this can be done by the interlocking method that is, inserting one of the sharp-ended fragments into the medullary cavity of the other. In transverse fractures, by an intramedullary splint taken from the fractured bone.

If necessary to use metal plates and bands are preferred to wire nails and screws, for transverse fractures, Lane a plate, and for oblique ones the steel bands of Parham and Martin. No weight should be borne upon a femur which has been fractured for four months, and good functional results should not be expected sooner than six to twelve months.

Scudder C. L., and Miller, R. H.: Certain Factors Concerning the Operative Treatment of Fracture of the Patella. *B. Med. M. & S. J.* 9, 6, 1914, 44.

The authors report the results of operative treatment at the Massachusetts General Hospital in the treatment of fracture of the patella.

Open operation, suture with absorbable material, immobilization for a few weeks, the patient walking with knee fixed and early active motion and massage were the methods used.

It believes the non-operative methods result in ligamentous union because of lack of bony contact which is often impossible.

Eighty-one per cent of cases have demonstrated bony union, and 9 per cent have failed to get bony union.

Thirty-eight cases were followed. 94 per cent had full extension at the knee. 60.5 per cent had full flexion. 57 per cent had full extension and flexion. 63 per cent could work as well as before fracture. Twenty-two cases were X-rayed. 85 per cent had bony union—8 per cent by bridge of bone. 18 per cent had no bony union. Good results were found in those having non-union.

In the series 30.5 per cent had limited flexion. The author believes that in order to improve the result of operative treatment of fractures of the patella more accurate reduction is needed and an encircling suture of absorbable material such as kangaroo tendon is a most satisfactory aid.

H. W. MEXTER

SURGERY OF THE BONES, JOINTS, ETC.

Leriche, R. Removal of Subperiosteal Bone Fragments in the Primary Treatment of Artillery Wounds. (*L'excision sous-périoste des fragments d'os*) *Revue de chirurgie et de médecine* 9, 6, 45.

Leriche says that the rapid and large hospital clearances during recent months have shown the good effects of primary, systematic surgical intervention in fractures caused by artillery projectiles. As a general rule the interventions made formerly were not sufficiently extensive and more or less extensive infection marked the evolution of wounds in spite of the application of antiseptics etc. The necessity of such intervention may be gauged from the fact that in 14 diaphyseal fractures recently received radiography showed bone fragments in course of necrosis in 14, and in 5 of these surgical intervention was necessary to remove the fragments. While Leriche does not doubt but that in some of these cases suppuration would have ultimately succeeded in expelling certain of the fragments and that the fractures would have ultimately consolidated without re-operation, yet he is quite sure that the resulting callus would have been osteitic, large or painful. He believes that the ideal which should be sought in war surgery is not merely consolidation, but aseptic consolidation and that a pathologic

callus is in general bad and should not be allowed to form.

Leriche thinks that in artillery fractures early intervention should be by rigorous and complete esquiectomy. By this term is meant the complete removal of all fragments of bone etc. in the fractured area. The complete procedure recommended by Ollier which involves the total periosteum and not the fibrous periosteum alone should be followed. After such wide intervention and with out any antiseptic the wound is generally observed to evolve aseptically particularly when the clear ance is made immediately after injury or very soon after the first ephemeral suppuration. In such case if suppuration still persists it shows that there is something yet to be eliminated and further radio-graphic research is called for. Moreover with such a procedure the callus formation is quite normal and aseptically built up of healthy osteogenetic elements unaffected by any process of infection. Necessary surgical esquiectomy is therefore also physiologically permissible. When such is done widely and fully in the subperiosteal manner pre scribed by Ollier the healthy periosteum rapidly effects the reparations called for.

Leriche therefore concludes that wide esquiectomy should be done in all fractures due to artillery projectiles in order to constantly assure an immediately aseptic evolution of the injured region (that is, by an aseptic reparation of the solution of continuity which is the primordial interest of the wounded man. Besides it removes the unjustifiable fear of pseudo-arthritis and subacute and chronic osteitis, which give a gloomy prognosis in cases of insufficiently operated fractures. W. A. BRENNAN

Schmieden V. Bone Suture in Granulating Wounds (Die Knochennaht in granulierender Wunde) *Zentralbl f Chir* 1916 No 39 779

The author discusses injured and infected joints and injured and infected bones of the lower extremity which on account of the infection have large granulating areas and in which union of the bony parts cannot take place. Rather than wait for the part to heal completely until all sinuses have healed and a pseudarthrosis has developed where weight bearing is necessary a procedure which with the ordinary method of treatment with casts, splints, scraping of sinuses etc. will take many months the author advises that bone suture in granulating wounds be done as soon as the patient is free from fever and the wound is clean. Irrespective of the amount of secretion the wound is laid open under lumbar anesthesia, the bone ends are freed of the soft parts without much damage to them and the granulating ends of the bone are cut away clean with a saw so that two fresh surfaces of healthy bone are approximated. The ends of the bone are then perforated through the granulations and stout bronze wire is used to bring the bony surfaces together. The limb is encased in a fenestrated cast and the wound treated open or with a

few loosely applied pieces of gauze to insure removal of secretion. In six to eight weeks the bony union usually is so firm that a second or the last cast can be applied. The wires are removed through the window of the cast about the fifth or sixth week.

The operation produces excellent results even if a few sequestra have to be removed at the time of the operation or sinuses have to be drained by counterincisions. These do not hinder the bony union and the entire time of healing is shortened by many months and especially the long waiting for all sinuses to heal and before an aseptic bone suture can be undertaken.

The advantages of the method lie undoubtedly in the rapidity with which healing occurs, in the certainty of ultimate cure as against a disadvantage of a slight shortening which can be corrected with a high sole apparatus. L. A. JUNKER.

Broca, A.: Some Principles in the Prosthetics of the Lower Limb (Quelques principes pour la prothèse du membre inférieur) *Presse méd* 1916 p 389

In the manufacture of artificial legs the author thinks that the American method of fitting the stump in a hollowed cone of wood is very much superior to the older methods of leather cone with metallic armatures. Contrary to the opinion of American orthopedists however he does not think that the tangential contact of the cutaneous surface with the hollow cone gives a support of any great value. It does not give support to the weight of the body at the points of application where such support is necessary. In the case of a thigh amputation the ischium is the point where support of the body weight is needed and in a leg amputation the support is needed at the tibial plateau.

A further point referred to by Broca is that American manufacturers have been unanimous in declaring with Depage of Brussels that a leg amputation is superior from the prosthetic and functioning point of view to any kind of a partial foot amputation. Such stumps never give satisfaction and the patients do not walk so well as if the limbs had been amputated 4 or 5 cm. above the tibiotarsal articulation. Broca is of the opinion that certain partial amputations of the foot are compatible with excellent prostheses. Such procedures have only one drawback which perhaps explains the manufacturers position that apparatus of this class are difficult to make.

Chopart's amputation has one grave defect the anterior muscles have not sufficient leverage so that the patient walks not upon the lower face of the calcaneum and on the plantar surface but on the head of the astragalus and the calcaneum. However if precautions are taken this inconvenience may be obviated and it is an exaggeration to say that Chopart's amputation never gives any but poor results. Some of the results obtained by the author and other surgeons with Chopart's amputations have been very good. W. A. BRENNAN.

Gerster J. C. A. Nail Extension in Fractures of the Lower Extremity *J Am M Ass* 9 6 level 14

In fractures of the lower extremity where immobilization by plaster cast or continuous traction by Buck's extension is impractical Gerster advises nail extension a method in which continuous traction is applied to the ends of a steel nail transfixing the femur or tibia in the lower fragment or the os calcis. This nail was allowed to remain as a rule from twenty-eight to thirty-five days. Nail extension is indicated in the following conditions recent simple fractures with extensive abrasion, recent compound fractures with much destruction of soft parts, multiple injuries to the same limb fractures of several weeks standing with much shortening, and old malunion with long-standing contraction of the soft parts.

The objections of pain and infection have been brought against the method. Pain is eliminated if the skin of the leg or thigh is pulled upward, while the nail is inserted. Infection will be absent if strict asepsis is observed and if care is taken to keep the site of insertion away from the fracture hematoma marrow cavity joint cavity or epiphyseal line. R. G. PACKARD.

Bosquet J. Early Treatment of Knee Injuries Excepting Those with Osseous Destruction (*Traitement précoce des plaies de genou à l'exclusion des lésions osseuses*) *Liv 4* 9 6 ed. 633

In knee joint war traumatism Bosquette treats injuries of the cul-de-sac by simple arthrotomy alone. Where there is penetration of the joint fragments must be extracted and the articulatory zone drained. In such cases wide resections are necessitated.

Bosquette thinks that in injuries of the knee joint without osseous destruction or without extensive fissures of the epiphyses an early intervention almost certainly prevents the development of purulent arthritis as well as mutilating operations which sometimes result in poor function later on.

Injuries of the subtibial cul-de-sac generally yield to arthrotomy of the cul-de-sac. Marginal cul-de-sac injuries with or without osseous lesions call for simple mesh drainage of the articulation breach with a secondary arthrotomy only in case of necessity. W. A. BROWN.

Sencert L. The Treatment of Knee Injuries at the Front (*Le traitement des plaies de genou à l'avant*) *Bull et mem Soc de chir de P* 9 6 ed. 964

In the early part of the war the treatment of knee joint injuries gave the most unsatisfactory results and caused much doubt as to the efficacy of the modes of treatment then practiced. During the first year such injuries were being frequently followed by suppurative inflammation and death, but during the past year these results are no longer observed. The radical change is due to the better

knowledge now extant of the anatomy and pathologic physiology of war injuries of the knee and also to a better appreciation of the indications and mode of treatment.

The result of experience in this class of injuries is summed up by Sencert as follows:

Punctiform wounds by bullets or small pieces of shell should be treated by operative abstention, by asepsis of the orifice and by immobilization of the knee in a plastic apparatus.

Medium grade or extensive injuries by shells, grenades, etc. should be operated upon immediately by a killful aseptic radiography of every case.

3. If foreign bodies are radiographically revealed in the neighborhood of the wound, they should be removed by lateral arthrotomy followed or not by synovial suture. When the projectile or other foreign body is at distance from the entry orifice and embedded in some part of the joint an exploratory arthrotomy should be done but care should be taken not to allow drainage into the knee.

4. If bony intra-articular lesions are revealed, either clinically or radiographically primary typical femoral tibial reaction is indicated.

Sencert and his colleagues have performed 10 lateral arthrotomies for penetrating knee injuries with intra-articular projectiles. There were 9 perfect recoveries and 1 was unsuccessful.

Of 2 wide exploratory arthrotomies which were performed success was obtained in all union being by first intention.

In 6 primary resections of the knee performed by Sencert during 1915-9 6 4 cases were successful, one amputation of the thigh was necessary and one patient died. W. A. BROWN.

Durant F. Orthomorphie Resection of the Knee Articulation (*Resezione ortomorfica dell'articolazione del ginocchio*) *Liv 4* 9 6 ed. 8

Durante's method of resection of the elbow by the interposition of a pediculated fascial flap is well known. With this method a very satisfactory function is obtained. Durante has attempted to obtain the same results from the same principle applied to knee resection. The procedure is as follows:

Formation of a semi-circular flap of the McKenzie type by an incision which descends from the middle of the free edge of the external femoral condyle and then passes for about 1 cm under the tibial tuberosity and finishes at the middle of the free surface of the internal femoral condyle.

2. Mobilization of the tibial tuberosity and formation of a flap similar to the rotatorius, from the aponeurosis with part of the muscular attachments, from the patellar ligament with its osseous insertions and from the patella itself. The lifting of this flap bares the knee articulation. This is mobilized by section of the other ligaments.

3. Osseous resection according to Durant's method viz. by using two wedges one hollow and the other full both corresponding the first

wedge inserted into the inferior femoral epiphysis by means of two oblique cuts which run almost parallel with the inclination of the inner edges of the two femoral condyles the second wedge being made at the expense of the superior tibial epiphysis.

4. Liberation by two longitudinal scissor cuts of the inferior semicircumference of the patella freeing the head of the patellar ligament and the two margins and suture of the patellar ligament by its osseous insertion with the aponeurosis and bending back the two aponeurotic flaps united by their margins upon the bleeding surfaces of the femoral condyles, maintaining them in position by sutures which fix their extremities to the retrocondyloidcan fibers.

5. Coaptation of the bone wedges and fixation of the patellar ligament.

6. Suture of the skin immobilization for 10 to 15 days then passive and active movements in order to favor the formation of a neo-arthritis which will meet in the wedges an impediment to abnormal lateral movements and in the presence of the patella and patellar ligament in front and the muscular attachments behind obstacles to the formation of genu antecurvature and genu retrocurvature.

W. A. BREKMAN

Mann A. T.: Nails and Screws Through Joint Surfaces. In Autografts and In Fractures Into Joints. *J Am M A S* 1916 lviii 1148

Mann has here proved that the knee joint can stand much more traumatism and foreign body irritation than is generally conceded. He cites twelve animal experiments in which he opened the knee-joint in dogs fractured the lower end of the femur at or near the epiphyseal line with partial or complete separation of the fragment and then repaired the fracture with or without accurate apposition with nails or screws and closed the joint. He left the heads of the nails or screws exposed within the joint. The cases all showed successful results with free smooth motion of the knees.

He found that the autografts united like simple fractures and seemed to live the bone trabeculae however being gradually replaced by new bone without the preliminary formation of cartilage. The nails and screws remained firmly embedded and were usually covered with new connective tissue. The line of fracture in the cartilage tended to cover over with fibrocartilage if narrow and with connective tissue if wide. R. G. PACKARD

McWilliams C. A. General Principles to be Observed in Bone-Transplantations. *Med Rev* 1916 xc 493

McWilliams gives twenty principles to be observed in bone transplantation. Most of the deductions are well known and appreciated by those familiar with the work and need not be repeated in this article. Some of the recommendations deserving of emphasis are:

1. Scrupulous care is necessary in securing the strictest possible asepsis.

2. In general all sinuses should be healed from two to three weeks before making an implantation.

3. A living graft should be transplanted with as much periosteum as possible.

4. As complete hæmostasis as possible should be secured hence a tourniquet should not be used.

5. After transplantation absolute immobilization should be maintained for from three to four months.

6. The inlay graft is preferable to an intra medullary one because in the former endosteum comes in contact with endosteum and periosteum with periosteum.

7. When operating on comminuted fractures the fragments should be retained and placed as nearly as possible in their original position whether the fracture be simple or compound.

8. A graft should not be transplanted into the midst of dense connective tissue as its nourishment will suffer. F. D. DICKSON

Pringle J. H.: The Interpelvic abdominal Amputation. *Brit J Surg* 1916 lv 383

The author has now performed this operation five times with three recoveries. A review of the literature shows that the mortality has been considerably lower in recent years. Of 24 cases reported up to 1909 there was a total mortality of 75 per cent. The mortality of all the cases reported up to the present time 43 in number is 58.1 per cent. While one of the severest operations in surgery the author is hopeful that with further improvements in the technique results may be still better.

The indications are (1) neoplasms arising from (a) the hip bone (b) a femur too high for removal by exarticulation at the hip-joint (c) muscles and fascia in the region of the hip (2) infective processes involving the hip-bone (a) tuberculosis, (b) acute osteomyelitis, (c) actinomycosis possibly in rare instances.

The author discusses the advisability of its performance in one or two stages, the possibility of modifications in the way of incomplete removal of the pelvic segment according to the nature and extent of the disease, paying special attention to (1) prevention of shock, (2) outlining the flaps (3) amount of bone to be removed (4) control of hæmorrhage.

The technique favored by the author is minutely described and he reports in full his last two cases both of which recovered. HORACE BENNETT

ORTHOPEDICS IN GENERAL

Chatterton C. C.: Mechanical and Surgical Treatment of Talipes Due to Anterior Poliomyelitis. *SI Pa M J* 1916 xviii 304

The author describes in detail early mechanical and surgical treatment of deformities of the foot due to anterior poliomyelitis.

In the acute stage the usual measures of rest, cathartics, light feeding and warm clothing, with proper mechanical apparatus to prevent deformity are outlined as the best methods of treatment.

In the convalescent stage the measures employed for treatment are:

1. Electricity which, in the author's opinion, is least beneficial.

2. Massage which undoubtedly increases blood and lymph supply and helps keep up muscle-tone and may also aid in the prevention of deformity.

3. Muscle-training, the author believes, to be more valuable than either massage or electricity.

4. Mechanical apparatus which meets best of all the therapeutic indications because through apparatus the child obtains muscle training massage thus preventing muscle strain and deformity and at the same time approaching the normal use and function of the affected limb or part. The apparatus, however, should be simple and easy of application to accomplish the result required. It should also be comfortable, light of weight and pleasing in appearance.

No surgical operation except the correction of slight deformities should be performed in the first two years. The operations described for the correction of foot deformities are:

1. Bony operations

(a) Arthrodesis

(b) Astragalectomy

(c) Articular transposition

2. Tendon operations

(a) Tenotomy

(b) Transference of tendons

The author has found the following tendon transference operations successful: (1) transference of extensor proprius hallucis to the head of the first metatarsal bone; (2) transference of the tibialis anticus to the outside of the foot; (3) transference of the peroneus longus to the opposite side of the foot or into the tibialis anticus; (4) transference of the peroneal group into the tendo calcillis; (5) tendon fixation operations.

3. Insertion of foreign material

(a) Silk ligament is often given satisfactory results even though the silk comes out of the tissue after remaining there months because it produces a false ligament.

(b) The reinforcing of ball joints with silk ligaments.

4. The implantation of nerves into paralyzed muscles has been tried experimentally but its results are still unknown.

5. Nerve anastomosis has failed to meet expectations in anterior poliomyelitis.

The conclusions are as follows:

1. In the acute stage rest, warmth, and prevention of deformity are still the vital treatments; great care being used to prevent the spread of disease.

2. Manipulation, muscle training, massage and motion is begun only after all neuritis has disappeared.

3. Only slight operations, tenotomies when stretching of muscles will not correct deformities, should be used in early stages.

4. Operations for permanent relief should be employed not earlier than two years after an acute attack.

5. Mechanical treatment long after surgical procedures is all important.

6. Mutilating bony operations should be avoided as far as possible in children.

Cohn A. Prevention and Limitation of Deformity in Infantile Paralysis. *Thor & Gas* p 6 xl, 687.

Cohn believes that in the past there have been many cases of infantile paralysis not diagnosed, especially in sporadic instances. Any case of a young child with fever and pain in the back or extremities should be watched for any paralytic development. The severity of any such resulting deformity can be greatly lessened by proper treatment.

Under treatment, absolute rest is all important for early sitting or standing through unequal pull of the trunk muscles and asymmetric methods of walking and standing. One-sided use of affected arm tends to exaggerate the deformity. Lumbar puncture by reducing the fluid pressure is beneficial. Electricity is probably worthless. Splints to preserve normal positions are very necessary.

To regain nerve and muscle power, muscle training is most valuable. A scheme by which the affected part is put through desired motion by voluntary movement led by the operator, passive assist, or c. This is best done before a mirror but the muscles must not be overworked. Hydrotherapy, massage, and bathing are very useful but electricity is questionable, certainly not advisable in the acute stage. Balm must be intelligently used and should correct deformity, prevent further deformity and assist in locomotion and support. Operative treatment which should never be done until after a period of two years includes various tenotomies, muscle and tendon transplantation, arthrodesis, and joint resection, insertion of silk ligaments, and nerve transplantation. R. G. Packard.

Gaenalen F. J. Infantile Paralysis—Its Management from the Standpoint of the Orthopedist. *Ill* 21 J p 6, vi, 48.

Infantile paralysis is an infectious, communicable disease caused by invasion of the brain and cord by specific micro-organisms. The greatest danger of communication is during the early stages. The incubation period is at least eight days, but the virus may remain on mucous membranes for five months. Hexamethylenamine is the only drug which seems to be of value, and should be given in large quantities to exposed children. Serum therapy is probably valuable 5 to 20 cc of serum from cases in which recovery is injected by lumbar

puncture and the dose repeated several times at intervals of twenty four hours. Since the diagnosis cannot be made previous to paralysis any exposed child complaining of indisposition muscle tenderness, girdle pains or restriction of neck motion should be isolated.

The treatment includes cathartics absolute rest (which Lange enforces by immobilization of the spine in a plaster shell) prevention of contracture by suitable splints and in the convalescent stage massage muscle training and possibly electricity. Surgical procedures later in the course include tendon transplantation or silk ligaments in partial paralysis, astragalectomy in dangle-foot or arthrodesis when a stiff joint is desirable. R. G. PACKARD

Osgood R. B. Orthopedic Surgery in War Times
J. Am. Med. Ass. 1916 LVIII, 418

Osgood discusses the part orthopedic surgery has in the assuring of physical efficiency in the ranks by means of attention to posture feet and shoeing.

In regard to septic wounds and joints the orthopedist conserves function in damaged joints and where ankylosis is inevitable places the fixed joint in a position which assures the greatest use.

Osgood found plaster-of-Paris dressings best using plaster bridges to span the open wound.

He urges conservatism in excision of joints. Proper apparatus and occupational training for the cripples are very important features of the work.

CURTIS LEE HALL.

SURGERY OF THE SPINAL COLUMN AND CORD

Young J. K.: Roentgen Diagnosis of the Lumbosacral Region. *Am. J. Orth. Surg.* 1916 XIV, 653

The author states that the final proof or absence of the location and extent of the disease or injury in the lumbosacral region must be determined by the X ray.

The three groups of affections in question are congenital anomalies, injuries and diseases. Congenital anomalies consist of irregular formation of one or both transverse processes of the fifth lumbar vertebra and anomalies of the body and transverse processes of the first sacral segment. Injuries include crushing of the bodies of the vertebrae, with and without fracture and displacement of the bodies of the vertebrae. Compression of the fifth lumbar vertebra usually results from a fall, the patient landing upon or crushed down by a weight from above.

The symptoms of compression fracture are local pain on rising or sitting down local tenderness limitation of motion muscular rigidity scoliosis and pressure pains. The X ray shows compression of the fifth lumbar vertebra on one side with or without fracture of the transverse process. If the process is fractured it will usually be observed projecting upward from the fractured surface and there may be callus at the seat of fracture or later hypertrophic arthritis at the joint and in the lumbosacral articulation. The symptoms of displacement include spasm of the muscles pain scoliosis with reflex pains increasing disability or complete inability to work. The X ray shows marked deviation of the spine with rotation of the bodies and compression of the intervertebral discs. Later hypertrophic arthritis of the lumbosacral articulation is seen. Ankylosis of the fourth and fifth lumbar vertebrae is common.

The traumatic form of arthritis deformans is the most common and is easily recognized. The X ray shows hypertrophic masses round and smooth bulging from the bodies of the vertebrae or sharp

irregular exudates upon the bodies or articular processes.

Tuberculosis is common especially in the fifth lumbar vertebra. The X ray shows rarefaction and later an area of bone destruction and absorption with necrotic islands with or without sinus formation.

Osteomyelitis gives a characteristic X ray picture of rarefaction and destruction of cancellous tissue the disease being at the time sharply limited by the articular surfaces of the individual bone as the ilium or sacrum. Specific osteomyelitis shows more sclerosis and less infiltrating destruction of the bone than occurs in acute pyogenic infection.

Malignant disease is very rare in this region. The X ray reveals an irregular mottled rarefaction with or without new bone growth the rarefaction becoming more and more marked as the disease progresses. In sarcoma the ossification progresses in an irregular and ragged way. The exudate presents a smoky appearance.

PHILIP LEWIN

Guillot M., and Dehelly G.: The Treatment of Pott's Disease by Hibbs' Method (Le traitement du mal de Pott par la méthode de Hibbs). *J. de chir.* 1915 XIII, 441

The authors have carried out Hibbs' operation in three cases the patients being 5, 15 and 4 years old respectively. The results obtained in these cases are summed up as follows:

1. In three months there resulted a solid fixation of the vertebral column.

2. The three patients appear to be in good condition but it is still impossible for the authors to conclude whether or not there is any curtailment in the evolution of the disease.

3. The operation fixes the column but does not straighten it. In certain cases the most that can be hoped for is a slight attenuation of the kyphosis by a mechanism which has nothing to do with straightening the column.

The authors are of the opinion that every begin

ning case of Pott's disease will respond to Hibb's method, with the exception of posterior tuberculous, in which case a focus would be opened which should at any cost be kept closed. A patient with

pulmonary lesion or one with foci of surgical tuberculosis or with a fistulized abscess should not be exposed to the double shock of operation and anesthesia.

W. A. BRIDGEMAN

SURGERY OF THE NERVOUS SYSTEM

Craig, C. B. Injuries to the Peripheral Nerves Produced by Modern Warfare. *Am J M Sc* 19 6 cil. 368.

The injuries of nerves described in this article are such as are based upon ten months' observation in the American Ambulance Hospital at Neuilly-sur-Seine and upon impressions gained by occasional visits to the Paris hospitals, as well as the hospital near the front and certain London hospitals.

In this article in speaking of the injuries to the peripheral nerves the author means only those in which the wounds produce some marked paralytic effect, distal to itself.

The suspension of functions may be due either to direct violence of the missile, flying fragments of bone or to the resultant hemorrhage and edema of the part or to circinal pressure during healing. The subsequent disability may be motor, sensory or both. Mild cases of loss of function in the hand or foot from wounds with hemorrhage or edema in the extremities above mentioned clear up rapidly providing the part is not immobilized.

Craig believes that the greatest lesson learned in the war in taking care of wounded on a large scale is to avoid immobility of the wounded extremities. Such mobilization produces what S. Weir Mitchell described as *causalgia*. This has been avoided and amply demonstrated in the American Ambulance Hospital. An overhead suspension device was used extensively with very good results.

Considering the enormous number of wounds of the extremities, the infrequency of completely severed nerves is quite remarkable, composing less than ten per cent of the cases of peripheral nerve injury. Completely severed nerve trunks are comparatively rare, however, all the symptoms of completely cut nerves may be present from contusion or compression of the nerve. The proportion of peripheral nerve injuries to the total number of wounded runs approximately as follows:

| | |
|--------------------|--------------|
| Musculospinal | per cent |
| Ulnar | 9 per cent |
| Median | 9 per cent |
| Circumflex | 5 per cent |
| Internal cutaneous | 4 per cent |
| Sciatic | 10 per cent |
| Obturator | 0.5 per cent |
| Long saphenous | 0.3 per cent |
| Popliteal | per cent. |

From injuries to the peripheral nerve produced by shot and shell Craig draws the following conclusions:

Lacerations and contusions may be differentiated usually by careful neurologic examination. In some cases, exposure of the nerve at the site of the injury is the only means by which the exact knowledge of the nature of the injury to the nerve is obtained. Neither test of function nor electrical reaction will differentiate contusion from laceration.

Cases of simple contusion recover slowly and as a rule completely.

3. Gunshot or shell wounds, causing lacerations of the nerves do not lend themselves readily to plastic operation. Because of the infection, weeks and months must elapse before plastic work can be undertaken. During the ten months, no recovery in such cases was observed.

EMIL C. ROYDEN.

Bassett, A. Wounds of the Limb Nerves by War Projectiles Based on Fourteen Operated Cases with End Results. (*Plaies des nerfs des membres par projectiles de guerre d'après 14 cas opérés avec résultats définitifs*). *Rev d'hyg* 9 6, 754.

The study of 14 cases of injuries to the nerves of the limbs leads Bassett to the following conclusions:

1. Lesions of the peripheral nerves by projectiles are more general in the upper than in the lower limbs.

2. Primary injuries (even in the case of bullet wounds) are very often infected. This infection is important from the viewpoint of extension, and on account of the abundance of calcified fibrous tissue which compresses the nerve. Section of the nerve owing to such compression is rare, but such compression effects irregularities, nodosities and sometimes more or less strangulation of the nerve.

3. Operation consists in extirpating the fibrous tissue as completely as possible, careful smoothing of the neighboring osseous surfaces, freeing the nerve, and abrading nodosities or other irregularities.

4. Resection is indicated only when electric reaction shows a complete interruption, or if the lesion of the nerve-trunk is very grave. It is necessary to protect the nerve against reiteration of compression by some means and the author recommends a thin caoutchouc strip placed about it.

The author reports upon 14 cases which he operated upon nine to thirteen months previous. One has been lost to view and 3 show no amelioration after suture of the nerve. Of the remaining 11, less than 10 per cent of the nerves of the upper limbs were distinctly more favorably affected by liberation than

those in the lower limbs. Of 7 interventions on the upper limb 2 have given excellent results 2 good 1 fairly good and 2 moderate results. In the lower limb 4 interventions have given 1 good result 1 fairly good 1 moderate and 1 bad result.

Ossseous vascular or musculotendinous lesions sometimes are associated with the nerve-lesions. On account of this the infection of the traumatized area is most persistent the cicatricial tissue more abundant and the nerve may be even directly injured by bone fragments resulting in functional disability. Hypaesthesia is more frequent than anaesthesia, and more or less extensive paralysis may be observed even when the electrical reactions are normal.

Operation should not be attempted until the wound has completely cicatrized. If there has been a fracture it is not only necessary to await its consolidation but even to delay some weeks other wise there is risk of reawakening a latent infection. Operation may be undertaken at the end of about three months if physical methods have not led to amelioration.

W. A. BRENNAN

Ingebrigtsen R. Transplantation of Nerves
(Transplantation des nerfs) *Lyon chir* 19 6 xiii
838

Ingebrigtsen reports the results of his investigations made in the Pathological Institute of the University of Christiania Clinic.

He defines transplantation as the complete liberation of all connections of a segment of nerve and its implantation in a living organism. This procedure may be autoplasmic, homoplasmic, or heteroplasmic. The questions that arise are

1. Can a nerve segment survive after transplantation?

2. If transplanted on a sectioned nerve can the segment contribute to the regeneration of the nerve?

3. How can this regeneration be effected?

The question of the survival or death of a nerve segment can be judged by examining the Schwann cells of the segment. If they are multiplied the fact of survival can be affirmed.

The author has made three series of experiments on rabbits by removing small pieces of the sciatic nerves and implanting them in muscular tissue (1) in the rabbits from which the sections were taken (2) in other rabbits (3) in guinea pigs. The sections were removed later at intervals varying from four to twenty-four days. The results obtained in regard to the autoplasmic and homoplasmic implantations were that there was a Wallerian degeneracy evolving in the same way but a little slower than in the peripheral portion of a sectioned nerve there was a multiplication of Schwann foci and an immigration of phagocytary granular bodies. On the contrary in heteroplasmic segments no Wallerian degeneracy nor multiplication of the Schwann foci was found. Twelve to fourteen days after transplantation the segments were quite necrosed.

These results are quite in accord with those of

Ranvier and Merzbacher while they differ from those obtained by Huber, Ballance and Stewart, Berga and Maccabruni. The conclusions to be drawn from them are (1) Since heteroplasmic segments undergo necrosis it is useless to try a transplantation with them in losses of nerve substance (2) Repair of loss of nerve substance must be effected either homoplasmically or autoplasmically.

The author has gathered from the literature reports of 32 cases of nerve transplantation in man the first by Albert in 1878 and the last by Jaboulay in 1911. Of these cases two are autoplasmic 6 are homoplasmic, and 24 are heteroplasmic. The author rejects most of these reports for want of sufficient data and reduces the total number to 14—1 autoplasmic 3 homoplasmic, 10 heteroplasmic. The heteroplasmic showed only 10 per cent successes.

The author has made three series of experiments on rabbits to test the value of nerve-grafting by resecting about 3 cm. of the sciatic nerve and joining the graft to the two ends by vaselined silk sutures. No attempt was made to prevent the formation of adhesions etc. as the author believes such to be injurious to the transplant. The experiments made consisted of 15 autoplasmic 29 homoplasmic 8 heteroplasmic.

The results obtained by the author were. The autoplasmic segments were removed and submitted to histologic examination from 20 to 163 days after transplantation. In all the transplanted segments he found numerous neurofibrillae which had penetrated in the segment of the central end. Twenty-one days after transplantation they had penetrated 12 mm. in the transplanted segment. From the 136th to the 163rd day the rabbits had regained normal motility in the limb and walked like healthy rabbits.

The homoplasmic segments were removed from 30 to 63 days after transplantation. In all segments examined the author found neurofibrillae which had penetrated the transplanted segment. There was no appreciable difference in the regeneration of autoplasmic and homoplasmic grafts. Electric stimulation showed complete motility of the limb in all rabbits with homoplasmic grafts examined.

The heterogenous grafts were removed from 12 to 63 days after implantation. They were yellow necrotic and had lost the consistency of living tissue. There were no neurofibrillae of neoformation, but in all cases there was a diffuse and considerable mononuclear infiltration.

The author has satisfied himself from experimental research that better results are obtained by transplantation of nerves than by suture and he thinks that the latter method should be replaced by transplantation, which is certainly superior.

W. A. BRENNAN

Law A. A.: Brachial Plexus Surgery *J. Am. M. Ass.* 19 6 lxvii, 865

Direct trauma was formerly considered the most frequent cause of injury to the brachial plexus

nerves until experimentation by Horsley and Taylor and a closer study of etiologic mechanics convinced observers that injury of the plexus did not frequently result from pinching them between the first rib but rather from their forcible avulsion which tore the cords out by the roots in the intervertebral and intravertebral cases and ruptured them anywhere between the spine and the axilla in the supraclavicular or infraclavicular types.

The relatively large number of so-called cases of birth palsy in infants, which at present are being reported lend confirmatory evidence that avulsion of the brachial plexus (trunk) comes from indirect violence to here the upper cord of the plexus is torn out of the foramen transversarium, by extreme rotation of the shoulder away from the head in the birth of the child.

Nerves which are forcibly avulsed are injured in a vastly different way than those which are liberately or incidentally cut cleanly across by a sharp instrument.

In the avulsed trunks the bundles of neuraxons are torn at different levels and are frayed and pulled apart and are very traumatized the end new blood vessels reformed hemorrhage occurs in the sheath, and this with the trauma of the accident and the hemorrhage about the nerves results in the secondary formation of scar tissue either in the nerve sheaths themselves or about them.

Later contractions of the multiple neuromatous nodules on the trunks which prevent the projection of the proximal axons into the distal segments, or the contraction of the perineural connective tissue strangulates the fibers to the extent of partially or wholly interfering with conduction which inevitably is followed by trophic changes and motor and sensory paralysis.

Symptoms of brachial plexus injury or rupture are dependent on where the cords are injured. In the upper arm type Erb-Duchenne type the injury generally occurs in the fifth and sixth branches proximal to the origin of the supraclavicular nerves and therefore the supraclavicular and infraclavicular are paralyzed. The characteristic atrophy of these muscles occurs along with inward rotation of the shoulder and arm until the hand and forearm is in extreme pronation. Winging of the scapula when the arm is held horizontal and pushed forward when the injury is high enough to be above the origin of the long thoracic nerve and because of paralysis of the serratus muscle.

In the Klumpke or lower arm type the eighth cervical and first dorsal branches are involved and the symptoms are manifested in the areas supplied by the median, lateral cutaneous, and lesser intrinsic

cutaneous nerves, while the innervation to the upper arm and shoulder may be intact.

A case is reported in which four and a half months after injury operation showed neuroma of the musculocutaneous this was resected until the normal fasciculus of both stumps were determined. The stumps were approximated with fine chromic gut sutures and the line of union was wrapped with a pedicled fascial flap from the stump of the pectoralis major. The clubbed distal end of the musculospiral was resected and implanted by an end-to-side anastomosis to a slit of the median nerve anastomosed with chromic gut and the line of union was wrapped with a pedicled flap of axillary fat.

Thirteen months later by reeducation the patient has nearly a normal return of all the functions in the limb. Biceps brachialis, biceps brachialis, and triceps he could extend supination and pronation of forearm fairly well flex the wrist and the second third and fourth fingers well the index slightly and the thumb not at all. The sensation of the last three fingers about 5 per cent of the sensation returned except for the radial half of the forearm and hand, or corresponding to the distribution of the musculospiral in the forearm and radial nerve.

In the second operation all the cords were found broken by scar tissue near the middle of the plexus. The first and second cords just after they emerged from the foramen showed definite neuromatous nodules and regrowth and the eighth cervical and first dorsal nerves were buckled on the medial side although they still were able to connect to the foramina. For the stimulus showed no response from the ulnar. The ulnar nerve was sectioned high and by an end-to-end suture was united to a notch in the musculocutaneous that being the trunk giving the greatest favorable response—and the line of union was wrapped with a free fascial flap.

The entire brachial plexus was then covered by pedicled flap of axillary fat to prevent reformation of scar tissue.

Four and a half months after operation the trophic improvement in the limb was marked sensation had returned in the arm and forearm to within two inches of the wrist and there was also sensation in the thumb.

This conclusion that while none of the reported cases of avulsion in the adult in which operation was performed showed complete recovery still enough function was regained to justify interference. Such interference should include nerve transplantation when indicated, as the clinical and experimental evidence has proved the efficacy of re-education.

Lecture II L. 22

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS ULCERS,
ABSCESSSES, ETC.

Olsson G M The Value and the Danger of the Biopsy in the Diagnosis of Cancer of the Skin and Mucous Membrane *Urol & Gynec Res* 1916 xx 546

Olsson belittles the danger of removing a small piece of tissue (size of a grain of wheat) or a larger piece removed by the cautery for diagnostic purposes. Cancers of the skin and mucous membranes bleed frequently and scabs are picked off by the patient causing bleeding without rapid metastasis. Prickle-cell epithelioma cells early invade the lymph-spaces and vessels thus causing metastasis which does not result from ulcerated area invasion. Thus he thinks biopsy increases the danger of metastasis only to a very slight degree, and then only in the prickle-cell variety. The advantages of biopsy more than offset this danger.

His conclusions are as follows:

1 The danger of metastasis following a biopsy in cancer of the skin and mucous membrane has been very greatly exaggerated.

2 An early and absolutely certain diagnosis is so important in cases of skin and mucous membrane that a biopsy should be made at once in every suspicious case.

3 The biopsy is the most important single method in the diagnosis of cancer of the skin and mucous membrane.

4 The following conditions simulate cancer of the skin and mucous membrane: syphilis, tuberculous of the skin and mucous membranes, certain mycoses of the skin, benign tumors and precancerous lesions. An absolutely certain differential diagnosis can be made in each one of these conditions by the biopsy. CARL R. STEINKE

Warner F The Relation of Arteriosclerosis and Other Anatomical Changes of Old Age to the Development of Epithelial Malignancy: a Study of 206 Cases of Carcinoma. *S. G. GYN. C. & Obst.* 9 6 xliii 413

Numerous research workers have referred to the frequency with which malignant growths are associated with obstructive endarteritis, connective tissue increase and lymphocytic infiltration. Some in support of the anatomical basis of the cause of cancer have gone so far as to contend that obstructive arteriosclerosis and connective tissue increase are usually present and that they bear a positive causal relation to the production of carcinoma.

With this thought in mind the author undertook a study of 206 cases of carcinoma to ascertain how constant a relation these conditions bore to cancer. In addition to this he made a study of a considerable number of specimens as a control series of organs

removed for various non-malignant disturbances from patients of the so-called cancerous age.

The result of his study was that of the 206 cases of carcinoma of all organs and regions examined 105 showed arterial obstructive changes. This gave substantially an equal division between endarteritis 50.96 per cent and normal vessels. Fibrotic changes were present in 118 cases 57 per cent. Lymphocytic infiltration was present in 85 cases 41 per cent.

That endarteritis and the anatomical changes of old age cannot be looked upon as a constant factor in the production of cancer is shown by the fact that normal vessels were present in almost half the cases. The same held true in relation to connective tissue increase. Lymphocytic infiltration while present in less than half the cases plays a rôle that is protective rather than etiological. The author found that many uteri with normal vessels showed cancer-cell infiltration and normal connective tissue. Inasmuch as so many of the non-cancerous uteri showed the so-called old age conditions one would expect to find cancer in them more frequently if they are a positive factor in the development of cancer. Lymphocytic infiltration even when present varied greatly in amount. This was true not alone of the cancers but also of the various tissues used as controls in some cases being very pronounced in others quite slight in amount. It was especially marked in the rapidly growing carcinomata.

The author concludes with the statement that certain biochemical factors of a local or internal and general type are probably responsible for some cases of cancer at least.

Barnes H de B Coley's Mixed Toxins in the Treatment of Sarcomata; Report of Four Cases of Osteosarcoma Treated by This Method. *J. M. Ch. St. M. Soc.* 916 xv 497

Detailed reports are given of four cases of sarcomata in which toxins were used. Three of them were examined microscopically and proved to be of a giant-cell type arising from bones. These three were operated upon and given the toxin as post-operative treatment.

The fourth case was a huge sarcoma of the antrum which was inoperable. All four cases are well a year after and show no evidence of metastases.

H. G. SLOW

Wetherill H G: Balance of Power in Infection. *Tr. West. St. M. Soc.* 1916 Dec.

The author points out that in certain infections of the more or less chronic types tuberculosis for example warfare is often waged in many different fields in the body at about the same time the battle may be going fairly equally or the invaders may be having somewhat the better of it under such cir-

circumstances, it may be possible for surgery to come to the aid of the defense, thus establishing what may be called "balance of power" for the defense as against the disease.

Wetherill's interest in this subject lies chiefly in the clinical aspects as presented in a large number of tuberculous individuals coming to Colorado many of whom present multiple foci of infection many of which are amenable to surgical treatment. He believes that advanced tuberculosis, with multiple foci of the disease, rarely remains a pure tuberculous infection; that other organisms are engrafted upon and into the damaged tissues and organs, so that a mixed infection occurs and about many of the primary tuberculous lesions. It is most often in such foci of mixed infection that the necessity for surgical interference arises, and it is in such fields that judicious surgery may do the most for the patient. He believes that unmixed foci of tuberculous infection rarely require open surgical treatment; whereas, those with engrafted streptococcus, staphylococcus and colon bacillus, or other mixed organisms implanted into them are almost invariably highly dangerous to the patient and soon become a proper field for surgical interference if the balance of power is to be established for the defenders of the human economy.

Many factors enter as elements of success or failure so that the author believes it is not too much to say that the substandard risks call for a nicer and finer surgical judgment and skill than almost any other class. Every detail—the choice of the anesthetic and of the operation, the skill of the surgeon and the after-care, the nursing, nutrition, and the ventilation of the sick room—make for success or failure; nothing, however, appears to be so important as the selection of the right time to operate. Operations during the earlier and more acute stages are believed by most surgeons to be very wise.

Many physicians and surgeons in Colorado of large experience believe that such cases of surgical tuberculosis do better before, during, and after the operation in Colorado than in the duller, damper and lower country about. The author believes that the many days of sunshine, the dry atmosphere, and the altitude are important factors in helping to bring about good results.

There are many agencies at work which retard the growth and development of the etiologic pathogenic and saprophytic organisms which cause these conditions. The best results appear to have followed operations for the evacuation and obliteration of the cavities containing pus and pyogenic membrane and the removal of an organ; the function of which has been greatly impaired or totally destroyed by multiple abscesses as may be the case with a kidney, a testicle, or even a lung. The effect of such operation in reducing toxæmia, the elimination of foci from which the diffusion of disease takes place, is at once apparent in the marked improvement of the patient, if the time at which the operation is done is well chosen, the details of preparation op-

eration and after-care are minutely ordered to save time, exposure, and exhaustion for the patient, and he be saved from a long and badly managed anæsthesia the last being very important.

Saprophytic organisms readily find access to the damaged tissues about the tuberculous foci, and, invading them, bring disorganization and decomposition which produce fever or toxæmia. Removal of the devitalized, saprogenic organ turns the scale in the patient's favor and his chances for recovery are at once enormously improved.

EMIL C. ROUSSEAU.

Sherrill J. G. Traumatic Asphyxia. *T. South*
S. & G. Co. 433 White Sulphur Springs, 9, 6,
Dec.

Sherrill reports the case of a bridge-builder aged 35 years who was injured by being caught and squeezed between the ends of the top chords of a new truss while he was being placed in final position doubling him up and bringing his head down on his knees. The weight of the chords was very great—it was estimated the cord which came down upon him weighed at least seven tons. No accurate statement of the time this chord was pressing upon him could be obtained, but it must have been of brief duration. He presented marked ecchymoses and swelling over the head and forehead and down to the cheek bones on the face. This area was dark purple in color and clearly delineated by an abrupt margin where the healthy color of the skin joined the often discolored part. Pressure did not affect the discoloration. There was present a subconjunctival hemorrhage on each side which was bright red contrasting strongly with the purplish discoloration of the adjacent tissues—a striking appearance. Rupture of each ear drum with hemorrhage from the ear canal was noted. Bleeding also occurred from the nose. There were no other injuries except a few minor bruises and fracture of the seventh rib on the right side. The patient was fully conscious and the reflexes were normal, with no evidence of cerebral injury. The pupils were equal and responsive to light and accommodation.

The diagnosis of traumatic asphyxia was confirmed by the subsequent history of the case. The discoloration of the skin cleared up promptly in about three or four days, that under the conjunctivæ persisting much longer. The patient recovered without untoward incident.

From the study of the literature at hand the conclusion may be reached that the condition usually results from sudden and forcible compression of the chest and abdomen, while the head and perhaps the extremities are not compressed. In this case however the neck was pushed forward firmly toward the chest, resulting in the constriction of the veins in the neck similar to that occurring from strangulation by hanging. This case seems even more strongly than the others reported to show that the discoloration is due to increased venous pressure although most observers have held that this is of

prime importance, and acts on the superficial veins of the face and head because of the lack of tissue support and the incompetence of the valves. This contention is also supported by the fact that in the case reported by Bolt the discoloration occurred everywhere over the face and head except where a snugly fitting cap pressed upon the head. The same effect is shown by the pressure of the collar as noted in Winslow's case.

The pathology of these cases consists in discoloration of the skin from venous distention or hemorrhage in varying degree subconjunctival hemorrhage, rupture of the ear drum with hemorrhage from the canal, and epistaxis and swelling of the skin. The latter and the discoloration also is limited to places that are not subjected to supporting pressure and usually extends no lower than the clavicle, although in some rare instances there is some discoloration in the axilla. Discoloration in the soft tissues disappears very promptly in the course of a few days that of the conjunctivae at times persists for several weeks. Coincident injuries, of course make the other pathological changes different in each case.

Usually there are no cerebral lesions present, although in some instances transient blindness has been noted. This absence of brain lesion has been attributed to the fact that the veins supplying the brain are supported properly by the surrounding tissues which is not the case in the more superficial veins. In the latter the inadequacy of the valves can be proved by the fact that the injection of the vena cava in the dissecting room distends the superficial veins of the neck, while those of the arms are unaffected.

The symptoms of this condition are marked discoloration in the skin of the head, face and neck, extending down to the clavicle. Posteriorly there is in some cases marked extravasation over the trapezius muscles. The ears are sometimes not involved, neither is there discoloration nor swelling under a tightly fitting cap nor where the pressure of a collar supports the neck. The conjunctivae are very red and in striking contrast to the purple mottled appearance of the remainder of the skin. The lips and tongue may be somewhat swollen and together with the mucous membrane exhibit the same purplish tint as the skin, and hemorrhages may occur from the nose and ears. The patient may be momentarily unconscious, although this symptom is not frequently seen and disappears in a short time. Of course one must not overlook the possibility of concomitant injuries of a serious nature in these cases. The discoloration usually disappears rather promptly except that under the conjunctivae, which persists for a longer time.

The prognosis is usually favorable, recovery taking place in most cases quite promptly. It will depend, of course, to a large degree upon the amount of pressure and the length of time which it is applied, as well as the gravity of coincident injuries. From the nature of the injury and its manner of occur-

rence, surgical aid can rarely be had immediately however when possible, the immediate use of artificial respiration and oxygen should be employed. Usually shock is slight, except where the accompanying injuries are severe. The subsequent treatment should consist in combating shock if it is present keeping the patient at rest, and meeting indications as they arise.

DeCastro A.: Acromegaly and Recklinghausen's Disease (Acromégalie et maladie de Recklinghausen) *Nouv. icon. de la Salpêtr.*, 1916 xxviii, 34.

In 1912 DeCastro published the report of a case observed by him in which acromegaly was clinically associated with Recklinghausen's disease. Another case has been reported since. Recently Roubinovich and Sondiére have criticized the connection of these diseases, and in DeCastro's case think that the proof of the involvement of the pituitary gland is incomplete, especially the radiographic proof.

DeCastro has recently been able to again observe the patient who came to the hospital in 1914. Radiographs made demonstrate hypophyseal involvement. There is considerable enlargement of the sella turcica and separation of the anterior and posterior clinoid apophyses.

The man died shortly after in the hospital and the autopsy report showed that the hypophysis was very voluminous and projected into the cranial cavity. Besides it had developed two lateral lobes. The part of the hypophysis lodged in the sella turcica was small and reduced to a mass without consistence.

W. A. BRENNAN

BLOOD

Heltz Boyer: Hematoma and Gaseous Gangrene (Hématome et gangrène gazeuse) *Presse méd.* 1916 p 394.

Referring to cases recently observed by him, Heltz Boyer calls attention to the relations which exist between certain hematomata localized in the limbs and the appearance in the underlying segment of gaseous gangrene phenomena. Such hematoma due to a lesion of the larger vessels of the limb are in the beginning of great use in arresting hemorrhage owing to the pressure exercised but this same compression exposes the patient to a formidable complication i.e. gangrene, which in the exigencies of war is almost always gaseous. This gangrene which might be called secondary gangrene, has in the different cases observed by Heltz Boyer developed in tissue dead owing to vascular disturbance. The development of such gangrene is often quite evident, as in a recent case of Heltz Boyer in which an iterative secondary hemorrhage of the forearm necessitated a second ligature and in which gangrene developed within a few hours.

Heltz Boyer thinks that when such a gangrene is manifest immediate amputation must be resorted to the limb being now in a state more or less dead

and constituting a toxic focus which no treatment other than removal could conquer. Preventive treatment consists in methodically seeking and opening any hematoma of the limbs consecutive to a lesion of the larger vessels such being often marked in an insidious guise. Only in this way can ulterior complications such as secondary hemorrhage, false aneurisms, and more especially this variety of secondary gaseous gangrene be avoided.

W. A. BAR.

Dubin, H., and Pearce, R. M. Blood Fat Before and After Splenectomy. *Arch. Int. Med.* 9, xviii, 426.

The authors refer to the recent work of King and Effinger who found that the removal of the spleen resulted in an increase in the total fats and lipoids, an increase in cholesterol, and a decrease in the unsaturated fatty acids as expressed by the iodine number. In addition it was also found that in severe anemias there was a very high iodine number suggesting that hemolysis in anemia was in some way related to the unsaturated fatty acids.

Dubin and Pearce, repeating some of the work found that on analysis before and after splenectomy of the blood of dogs there was practically no change in the amount of total fats and unsaturated fatty acids as expressed by the iodine value. These results are summarized as follows:

BLOOD FAT BEFORE AND AFTER SPLENECTOMY

| Dog | Before Splenectomy | | Ten Days after Splenectomy | | Remarks |
|-------------|--------------------|---------------|----------------------------|---------------|--|
| | Total Fats, Gm. | Iodine Number | Total Fats, Gm. | Iodine Number | |
| 1-11, Brown | 6 | 5.6 | 6.1 | 5.6 | Blood drawn into vacuolate blood drawn into vacuolate blood drawn into vacuolate blood drawn into vacuolate blood drawn into vacuolate |
| 2-11, Brown | 5.7 | 4.5 | 5.7 | 4.5 | |
| 3-11, Brown | 4.3 | 5.3 | 4.3 | 5.3 | |
| 4-11, Brown | 5.4 | 7.8 | 5.4 | 7.8 | |
| 5-11, Brown | 5 | 4.9 | 5 | 4.9 | |
| 6-11, Brown | 7 | 7.2 | 7 | 7.2 | Blood drawn into vacuolate blood drawn into vacuolate |
| 7-11, Brown | 7.6 | 7.2 | 7.6 | 7.2 | |

*The iodine number is calculated on the basis of the total amount of fatty extract found in 100 ccm. of blood; the total fats are calculated per 1000 ccm. of blood.

The same hematoma took place while separating the cells from the serum; there may be some inaccuracy in the relative values given for cells and serum.

C. G. HAYD.

Biological G. The Coagulation of the Blood in Operative Intervention (La coagulation del sang. en op. interv. operativ). *Clin. Chir.* 9, 6, xii, 73.

The author has already published results of his researches on the morphologic, physiologic, and biologic modifications of the blood consecutive to operative interventions. The present study of coagulation is supplemental and reference is made to a further contribution to this same study made by several other authors.

The results obtained show that in a fairly constant degree there is a postoperative augmentation of the coagulation of the blood whether the intervention is made under ether narcosis or not. This acceleration

in coagulation does not increase but rather tends to diminish and to disappear within a few days after operation.

The author does not attempt to draw any conclusion concerning himself to the fact of the constancy of the coagulation acceleration independently of the narcosis.

W. A. BERNARD.

Blechninn G. A New Method of Blood Transfusion (U. procédé nouveau de transfusion du sang). *Bull. Acad. Méd. Paris* 9, 6, livr., 211.

Blechninn points out that the methods of transfusion now in vogue require a delicacy of instrumentation and manipulation which are not always obtainable under the conditions of war surgery. He has therefore endeavored to find a method which would make blood transfusion a minor operation, as simple as intravenous injection. His procedure is based on these principles:

1. Rapid withdrawal of the venous blood from the donor toward the circulation of the recipient by the application of the physical phenomenon of siphonage.

2. Dilution of the blood in the transfusion apparatus by artificial serum.

3. The principal part of the apparatus to consist of a caoutchouc tube this substance, like paraffin possessing the property of retarding the blood coagulation.

The details of construction and the mode of application of the apparatus are described. Cases are cited in which the apparatus was successfully used.

W. A. BARNES.

Primrose, A. and Ryerson, E. S. The Direct Transfusion of Blood. *Bull. Med. J.* 9, 6, 334.

The authors emphasize the great value of blood transfusion in all cases of hemorrhage and report four cases successfully treated by transfusion.

Transfusion is the ideal therapeutic measure in all cases of hemorrhage. It increases the coagulability of the blood and improves the local resistance of the patient to infection. The improvement in the patient's general condition and in the local condition is seen even in cases which show little or no increase in the red-cell count, the introduction of a more concentrated blood causing an osmotic which quickly restores the former equilibrium.

The apparatus used by the authors is very simple consisting of two glass cannulae with rubber tubes attached, a dozen or more 20-cm. glass syringes. This apparatus is sterilized by heat and is then coated with liquid paraffin by first dipping the plunger of the syringe into paraffin and then drawing the paraffin up into the syringe through the cannula and tube. One cannula with its attached tube is connected with the vein of the donor and the other with the vein of the recipient. The coupling and uncoupling of the syringe is made at its junction with the rubber tube. The currents of flow in the cannulae must be constant normal saline being used whenever there is any delay in transfusing.

The cases treated showed marked immediate as well as permanent improvement and the donor experienced little discomfort being able to return to duty after a short interval even when as much as 1,000 ccm. of blood was taken.

The value of transfusion in the emergencies of military surgery cannot be overestimated as hemorrhage is one of the chief causes of death particularly in bullet wounds of the abdomen. J W. TURNER.

BLOOD AND LYMPH VESSELS

Haberer H. von The Aneurisms of War (Kriegsaneurysmen) *Arch. f. klin. Ch.* 1916 VII 611

In an extensive article von Haberer sums up the results of his experiences in the operative treatment of war aneurisms. He gives a collective report based on the indications and results obtained in his total of 72 cases treated operatively in the Reserve Hospital at Innsbruck.

He divides his treatment of aneurisms into three periods. In the first he treated 13 aneurisms by ligature with generally good results. In the second period he treated 29 aneurisms 16 by ligature and 13 by suture — 5 lateral 8 circular. In the third period he treated 30 aneurisms 6 by ligature and 24 by suture — 7 lateral and 17 circular.

The situation treatment and results in these 72 cases are shown in the following table

| Site of the Aneurism | Method of Treatment | | | | Died | Recovered |
|-----------------------|---------------------|-----------------|----------------|----------|------|-----------|
| | Total | Circular Suture | Lateral Suture | Ligature | | |
| Carotid communis | 5 | 3 | | | | 5 |
| Carotid interna | | | | | | |
| Subclavia | 14 | 3 | 6 | 5 | | 3 |
| Axillaris | | | | 5 | | |
| Brachialis | | | | | | |
| Radialis | | | | | | |
| Thrac. | 8 | 3 | | 5 | 3 | 3 |
| Intercostal | 4 | | | | | 4 |
| Poplitea | 4 | | | | | 4 |
| Tibiæ antica | 4 | | | 4 | | 4 |
| Tibiæ postica | 4 | | | 4 | | 4 |
| Tibiæ ant. and post. | | | | | | |
| M. tibialis lateralis | | | | | | |
| Transversalis | | | | | | |
| Glottica | | | | | | |
| Total | 72 | | | 3 | 5 | 67 |

One case ligat. red later.

One case amputated later.

Of the 5 cases with a fatal operative result 4 were treated by ligature and 1 by suture. The results show that of 72 aneurisms operatively treated 5 died and 67 recovered. Of the recovered 2 were subsequently amputated the other 65 cases recovered without mutilation. Von Haberer believes that the correct treatment of every gunshot aneurism must be operative and his experiences lead him to the following conclusions:

1. The ideal operation of every gunshot aneurism is vascular suture.

2. Vascular suture may be executed much oftener than is generally believed.

3. Vascular suture must as a general rule be circular rather than lateral because lateral suture narrows the lumen too much when there are large lateral defects and because there is also the greater danger of thrombosis of the sutured region endangering the function of the suture.

4. Suture is not indicated in very small arteries, in which ligature assures a collateral circulation.

5. There will always be cases particularly in the large arteries where ligature must be undertaken. Suture is excluded when there are extensive tissue defects and especially in severe infection, the disappearance of which cannot be anticipated.

6. Where ligature is necessary the ligature must be made either within the sac, or close to the sac, taking the utmost care of the collaterals.

7. Aneurisms should be operated upon only in properly equipped hospitals and if possible not in the field hospital. Trained assistants and an experienced surgeon are necessary. It is obvious that when there are dangerous complications such as hemorrhage or very serious infection aneurisms must be operated upon immediately.

8. The best time for an aneurism operation is between two and three weeks after the injury. During this time one is able to judge if a serious infection exists or not and if this is evident there should be no further delay.

9. Slight infections may occur weeks later and even after complete healing of the wound. They do not forbid operation nor suture when indicated. In doubtful cases it is best to take the precaution of draining for a few days.

10. All late operations are made unnecessarily difficult by the calluses resulting in the meantime.

11. For the same reason procedures such as compression of the aneurism are more harmful than useful. They only cause calluses and inflammatory changes in the sac.

12. In all gunshot injuries in which the projectile in its passage has struck one of the larger vessels judgment has to be most careful because even weeks later when the patient moves around an aneurism may manifest itself.

13. Infected aneurisms may simulate abscesses therefore the utmost care is advised in the examination.

14. Whereas in a successful vascular suture the patient can be treated as recovered after a month this is not the case in a ligature because here slight disturbances of the circulation remain for a considerable time which renders the man unfit for the heavy work at the front, especially in winter.

15. The results of vein transplantation in larger defects of the arteries are very doubtful.

16. The strength of a vascular suture is extremely great as is proved by the possibility of putting a simultaneous fracture in extension immediately after circular suture.

17. Aneurism followed by paralysis of the nerves is very frequent not because of lesion of the nerves

through the shot, but more on account of pressure from the aneurism.

The clinical details of the 72 operated cases are given.

W. A. BROWN

Boeckel, J. Two Cases of Arteriovenous Aneurism of the Femoral; Quadruple Ligature with Extirpation of the Intermediate Vascular Segment (Deux cas d'anévrisme artério-veineux de la femore quadruple ligature avec extirpation du segment vasculaire intermédiaire) *Bull Acad de med. Par* 9 6 livr. 139.

There are two types of arteriovenous aneurisms, one with a sac, the other without. The type without a sac is very rare and Delbet and Mocquet in 35 cases of aneurisms of the femoral, only found this type five times. Strictly it is not an aneurism but rather a simple fistula between the artery and vein. Such an effect is not usually the result of a primary lesion but occurs some days or even some weeks after it and is the outcome of a periarthritis and periphlebitis occasioned by the greater or less constriction of the vessels.

In the author's two cases he extirpated the intermediary vascular segment corresponding to the aneurismal sac, preceded by quadruple ligature.

W. A. BROWN

Horsley, J. S.: Traumatic Aneurism of the Temporal Artery. *J. South. Surg. & Gynaecol.* 415 White Sulphur Springs, 9 6, Dec.

Horsley calls attention to the infrequency of traumatic aneurism which differs from the so-called idiopathic aneurism of diseased arteries. A traumatic aneurism is caused by a trauma in a previously healthy vessel, and really results from the organization of a hematoma which is produced by this injury. Usually when an artery is injured by a trauma the patient either bleeds to death or the vessel is occluded by the pressure of the thrombus. When this does not occur a traumatic aneurism may result from a pocket or lake that occurs in the clot where the artery is injured. The conditions which promote this may consist of some deficiency in the elements of the blood or tissues that produce prompt clotting, or may be mechanical and result from a flap of intima being detached, or by pressure of the hematoma causing an eddy in the blood at this point. The temporal artery is very superficial, and with its terminal branch, the anterior temporal, is much exposed to trauma. It has but little protection by soft tissue either above or below it. Since 1866 a rather thorough search of the literature has shown only five cases of traumatic aneurism of the temporal artery and its branches. To these five cases, Horsley adds cases of his own.

In neither of Horsley's cases was there any evidence of syphilis or other disease of the arteries. One was in a youth 9 years of age who received an injury in the right temporal region while playing basket-ball. This was immediately followed by a large hematoma which was partially absorbed,

but resulted in a small pulsating aneurism about one-half inch in diameter. Operation was done seven months after the injury under local anesthetic the sac being excised after the arteries were ligated. The second case was in a young boy 9 years of age with a somewhat similar history who was injured while wrestling. In this case the aneurism formed in the temporal artery just above the zygoma. It was excised under local anesthetic. There was no recurrence in either case.

Barbarin and Lérat. Twenty-three Cases of Ligature for Vascular Injuries (Vingt-trois cas de ligat. et cas pour lésions vasculaires) *Presse med* 9 6 p. 4.

Among twenty-three cases which were observed by the authors in two and one-half months there was one death which occurred a few moments after ligature of the femoral vein in Hunter's canal. Autopsy showed numerous infarcts in the right lung. Three consecutive amputations were necessary. One amputation in a case of ligature of the antero-fibular artery was due rather to the osseous and articular injuries than to the effects of the ligature. In a case of ligature of the popliteal vessels the circulation not having been re-established, amputation was necessary three days later. The third amputation was done three days after the ligature of the femoral artery and vein in Hunter's canal, followed by gaseous suppuration. All three cases recovered.

In the 19 other cases the operation after course was good and no circulation troubles were observed.

W. A. BROWN

POISONS

Montals. Concerning Tetanus Following Serum Injection. Particularly Tetanus Without Trismus (Sur le tétanos post-sériques et en particulier sur le tétanos sans trismus) *Ann. de l'Inst. Pasteur* 9 6 xxx No. 7.

Montals helps to clear up the subject of local tetanus very materially. He has collected 21 cases from French sources of well-defined local tetanus without trismus and number of other cases in which trismus supervened later. All of the cases occurred in persons who had received the prophylactic dose of serum by injection.

Montals says that the first case of local tetanus was observed in 1913 and that the form of tetanus which begins locally and ends in trismus has long been appreciated yet the form which is designated as local now is a pathological novelty and that it is the outcome of serotherapy.

Montals distinguishes four degrees of tetanus: 1. In the first group, the tetanus remains localized in the region of the wound, the pontine and bulbar centers escaping altogether. This is, strictly speaking, local tetanus and it occurs almost entirely within the first month after the prophylactic dosage. The incubation may be only a few days afterward, but in one case it was three months. Only two of the reported cases died.

2. In the second group more frequently seen than the first although local in its onset there is evidence that the higher centers are not completely protected because after the lapse of days or weeks trismus and other general symptoms appear frequently of no great severity. The mortality as might be supposed is higher than in the first group.

3. In the third group the onset is usually from the second month onward the protection of the higher centers is much less. Trismus, cervical rigidity, and other of the well known general symptoms of tetanus are noted the local onset in the injured member is no longer seen or at least it is no longer sufficiently present to attract attention. In this group it would seem that there is yet some slight degree of immunity to modify the severity of the symptoms. The crises are not so severe as found in one entirely unprotected and the spasticity shows a tendency to persist. The mortality is from 33 to 50 per cent.

4. In the fourth group there is no evidence of protection and the tetanus is of the ordinary type. Montali states that the tetanus bacillus is found in wounds usually in the form of spores, and these may germinate, liberating toxins up to many months after implantation. The dormant spores may be awakened long after the effect of the prophylaxis has disappeared.

Why should early tetanus in the protected man assume the local form? The answer is both ingenious and plausible. It is generally understood that the central nervous system is invaded by the tetanus toxin by way of the peripheral terminations in the muscles, the channel being by way of the motor nerves. It is for this reason that the involvement of the spinal centers corresponds to the site of the wound. In the unprotected man simple local tetanus practically never occurs. In him the centers in the pons and medulla are the first to be attacked because they are more susceptible. The route to the centers in the pons and medulla is a roundabout one by way of the blood stream, unless the wound and focus of infection are situated adjacent to the cranial nerves. In the man who is protected the higher centers, beyond the spinal ones, are shielded by the antitoxin circulating in the blood, while the spinal centers are immediately accessible to the toxin in the wound. Montali believes that early local tetanus is the result of immediate and copious outpouring of toxin from the wound at the same time that in protected man the higher centers are receiving protection from the antitoxin in the blood stream, otherwise the case would resolve itself into one of the regular type with a rapidly fatal issue. In the simple local forms of tetanus the mortality is low because the prognosis depends upon whether or not the higher centers are attacked. Unless protection is kept up as already recommended the shield afforded by the antitoxin gradually wears away trismus and other general symptoms appear and the disease runs its customary course.

LOUIS A. LA GARDE.

Nobecourt and Peyre: Tetanus in a Child Cured by Intravenous Intensive Serum Treatment (Tétanos chez un enfant guéri par la sérothérapie intraveineuse intensive) *Presse méd.* 1916 p. 433.

A child 8 years old, after a superficial thumb injury developed tetanus on the fourth day. Within seven days 280 ccm. of antitetanic serum were injected in the veins also 40 ccm. in the cephalo-rachidian fluid. Amelioration did not take place until six days after treatment. From the sixth to ninth day of illness the child showed urticaria, fever, tachycardia, cyanosis, etc. After amelioration set in it progressed rapidly and the child was completely cured within a month.

W. A. BRENNAN

SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Ochsner E. H.: The Biochemistry of Topical Applications, with Special Reference to the Use of Boric Acid in Septic Infections. *Tr. South. Surg. & Gynec. Ass.*, White Sulphur Springs, 1916 Dec.

The laws governing the absorption of local applications to the skin have been the subject of considerable investigation and much controversy. This difficulty has been accentuated by the fact that until recently the laws governing osmosis and dialysis have not been understood and have invariably been presented incorrectly even in special works on this subject.

It has now been determined that osmosis is not dependent upon the semi-permeability of the membranes but upon the chemical affinity different substances have for each other. Thus, for instance, solid camphor will pass through a rubber dam if bisulphate of carbon is placed on the other side of the rubber dam while it will not pass through if water is placed on the other side of the rubber showing conclusively that the membrane alone does not determine whether all substances will pass through or not.

In the chemical laboratories hundreds of experiments have been made to prove the correctness of the statement that chemical affinities and not the semi-permeability of the membranes determine whether osmosis and dialysis will take place or not.

Concentration of the solution is also a very important determining factor.

Clinically the laboratory experiments can be duplicated by using solutions of boric acid and water as a wet dressing. Here again it has been determined that concentration of solution is of the utmost importance. A saturated solution of boric acid when applied to the skin will invariably appear in the urine in appreciable quantities within an hour and if a wet dressing is kept in place for a considerable time the amount of boric acid which appears in the urine may rise as high as two-tenths of one per cent. These chemical experiments, as well as clinical experiences prove rather conclu-

sively that in order to be effective boric acid must be used in saturated solution.

While boric acid does not destroy pathogenic bacteria, it greatly reduces their virulence as has repeatedly been demonstrated by injecting pus, withdrawn from septic infections into test animals before and after the application of boric acid dressings. If the pus is aspirated before the boric acid has been used it will kill the test animal in very much smaller quantities than that which has been removed after the dressings have been applied although ordinarily pathogenic bacteria become more virulent by being passed through human host.

The clinical experiences have also demonstrated that wet dressings of boric acid are much more effective in streptococcus staphylococcus albus and citreus than in any other type of infection.

In order however that boric acid may reach a maximum of efficiency some other directions should be observed such as absolute rest in bed proper attention to elimination by the lungs, skin, bowels and kidneys relief of pain if possible without the use of opiates by the addition of from 10 to 33 per cent of 95 per cent alcohol to the solution painting the inflamed area with 95 per cent carbolic acid until it turns white and then removing the excess carbolic acid with alcohol elevation of the extremity with the muscle surrounding the involved joint at equilibrium incision only when there is macroscopic evidence of pus and after a certain degree of immunity has developed. If incision becomes necessary an Esmarch bandage should first be applied whenever possible and then the incised wound should be swabbed with tincture of iodine before the Esmarch is removed and the part should be manipulated as little as possible. If all of these precautions are observed septicaemia pyemia and impairment of function will rarely if ever occur.

Müller J. L. Relation of the Hypophysis to Certain Clinical Manifestations and the Therapeutic Application of Its Extracts. *Am J M Sc* 916 44, 549.

Complete removal of the anterior lobe of the hypophysis results in death partial removal in developmental disturbances. Therapeutically active substance is present only in the pars intermedia of the posterior lobe, and affects the cardiovascular system, the kidney, uterus, urinary bladder, intestine, and the secretion of the mammary gland.

It is the generally accepted view that acromegaly is due to overfunctioning of the anterior lobe of the hypophysis. Dystrophia adiposogenitalis in all probability is due to the anterior lobe also the most convincing evidence being furnished by the experimental findings on dogs, in whom, when a considerable portion of the anterior lobe is removed, develops the Froelich syndrome of delayed development, adiposity and failure of sexual development. Removal of the posterior lobe is not followed by any serious consequences. Organotherapy in this condition has not given very definite results.

It is impossible to say whether either or both of the glands which show changes in adiposia dolosa, the thyroid and the hypophysis, are responsible for that condition.

The endeavor has been made to explain hypophyseal diabetes insipidus as the result of overactivity of the posterior lobe but there is no very clear-cut animal experimentation proof. A one after partial complete removal of the hypophysis, has been able to produce a permanent polyuria. The most conclusive evidence that the condition, when associated with hypophysis is due to increased rather than to increased secretion is furnished by clinical observations, several workers having shown that the subcutaneous injection of extracts of the posterior lobe will lessen the urinary output 50 per cent more. The author was never able to demonstrate by experiments on both normal and nephritic individuals that pituitrin possessed any diuretic action.

It is generally conceded that patients with acromegaly very frequently show either a transitory or permanent glycosuria but the conflicting results of the experimental effects to produce glycosuria in animals and the lack of constancy of the blood sugar make it apparently impossible to determine the rôle of the hypophysis in sugar metabolism.

It has been shown that while the galactagogue action of the hypophysis, which is present only in the posterior lobe produces an increase in the quantity and quality of the milk, yet there is a reduction below the normal at the next milking, so that the total output and the fat content is not increased for the twenty four hours. An immunity is also rapidly acquired after a prolonged use.

It is impossible to say whether any of the ductless glands are concerned in the development of osteomalacia.

Intravenously pituitrin causes a slow and prolonged rise in blood-pressure with slight relaxation of the heart on the uterus it stimulates contractions by its direct action on the unstriated muscle in properly selected cases its use being largely free from danger. On the intestine, posterior lobe extracts cause first a loosening of the tones and peristaltic action soon followed by increased tones and peristalsis. Its use has been recommended for postoperative peritonitis, in mild intestinal obstruction and in postoperative intestinal stasis. The author has seen no benefit in its intramuscular use in the abdominal distention of pneumonia.

Favorable reports have appeared on the use of pituitrin in causing spontaneous emptying of the bladder thus avoiding catheterization after confinement and after operation on the pelvic organs.

Pituitrin may be of value in controlling uterine hemorrhage of a certain character while it is recommended subcutaneously in nose and throat operations, in the treatment of pulmonary hemorrhage and in the reduction of the coagulation time of the blood. Should pituitrin prove to be a hemostatic it

will probably be through its coagulating rather than its vasoconstrictor action.

The above results are obtained only through the use of posterior lobe extracts given subcutaneously intravenously or intramuscularly but not when given by mouth. Evidence is still lacking that anterior lobe extract is of value in stimulating growth and sexual activity. E. K. ARMSTRONG

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Mann, F. C.: A Further Study of the Gastric Ulcers Following Adrenalectomy. *J Exp Med* 1916 xlii 329

In a previous study of adrenalectomized animals, the frequent occurrence of acute ulceration of the gastric mucosa and the occasional occurrence of duodenal ulcer were noted by the author. While these ulcers were not found in adrenalectomized animals subjected to continuous etherization and were infrequent in animals subjected to the removal of only one gland they occurred in about 90 per cent of those dying under the characteristic symptoms of adrenal insufficiency after the removal of both glands. The ulcers developed during the moribund period were apparently peptic forming at the site of the local hemorrhages in the gastric mucosa and were true acute ulcers, usually penetrating to the muscularis mucosa with a total loss of epithelium. While they occurred in the absence of pancreatic secretion and while they appeared to develop only in an acid medium.

In order to determine whether the acid medium was the important factor in the production of the acute ulcers, or whether their cause resided in other factors such as the splanchnic nerve or vascular mechanism of the stomach the following experiments were performed.

1. A loop of the first part of the jejunum varying in length from 6 to 12 cm. was functionally resected under anesthesia and implanted in the posterior wall of the stomach in the region of the antrum pylori. The continuity of the intestine was maintained by an intestinal anastomosis.

In four of these animals after a considerable length of time had elapsed the right adrenal was removed, and a few months later the left gland was extirpated. All developed the typical symptoms of adrenal insufficiency and died at various times after the removal of the last gland.

In all these animals definite lesions of the gastric mucosa were found at autopsy. In three there were ulcerations, while in one the mucosa was injected only and showed areas of erosion. In three the jejunal transplant appeared exactly similar to the control. In one there appeared to be a slight loss of jejunal mucosa in point areas which microscopically proved to be small ulcers.

The author hoped that these experiments would prove whether free acidity was the primary cause in the formation of these ulcers, or whether the

primary cause lies in the intrinsic mechanism of the gastric mucosa. The results of the experiments show that both factors are of importance. In the three experiments in which the gastric mucosa alone was involved the transplant having been left intact either the ulcerations and erosions were due to a primary impairment of the gastric mucosa to which the jejunal mucosa was not subjected or the acidity developed within the gland tubules and produced its destructive action there first. If the latter is true the jejunal mucosa might become involved afterward. The experiment in which the transplanted mucosa was involved might be interpreted in this way the author states. The evidence tends to show that the acidity is but a secondary although necessary factor and that the primary cause lies in the intrinsic mechanism of the gastric mucosa. However the fact that changes in the jejunal mucosa occurred in one experiment shows the importance of acidity.

The author finally concludes that acute gastric ulcers are found in a large percentage of animals dying from acute adrenal insufficiency. In dogs in which a portion of the jejunum had been transplanted some time previous to the removal of the adrenals the gastric mucosa showed more marked changes than the transplanted jejunal mucosa. This tends to show he believes, that the gastric juice as the cause of the ulcer is but a secondary although necessary factor. GORDON E. BUNNEY

Allison N and Fisher R F: Experimental Bone Tuberculosis. *Am. J Orth Surg*, 1916 xvi 631

In their forty experiments the authors established foci of tuberculosis in various regions of the bones of young dogs. The epiphysis and diaphysis of the femur the knee joint and the subperiosteal bone of the femur and tibia were chosen. Virulent human and bovine bacilli grown on glycerine agar media were used. 11 were epiphyseal 6 diaphyseal 19 subperiosteal and 4 joint surface inoculations.

From their experiments the authors conclude that it is possible to establish experimental foci of tuberculosis in any region of the bones of dogs. Their sections show growing foci in the epiphysis in the metaphysis in the diaphysis in the cortex of the shaft and on the joint surfaces.

They observed no essential difference in the reaction of tissues to the human or bovine type of organism. They found that where there were elements that lent themselves readily to new bone formation the tuberculous process was characterized not only by bone formation but also by a reaction of proliferation resulting in upbuilding of new bone. The latter observation was based upon the behavior of the periosteum and subperiosteal layers of bone in the experiments where the focus was implanted in the diaphysis or under the periosteum. In the experiments where the epiphysis or joint surfaces were inoculated this reaction did not occur for the reason that in these regions the proliferative elements are not found.

The authors believe that there is no essential difference between the reactions to tuberculous foci between spongy or cancellous bone and compact cortical bone, except that in the latter the element of bone proliferation plays an important rôle.

PHILIP LEWIN

Chesney A. M. The Latent Period in the Growth of Bacteria. *J Exp Med* 96 rd 387

Chesney divides the life cycle of a bacterial culture as determined by estimations of the number of viable organisms present at various intervals into four periods or phases, which, in the order of their appearance may be designated (1) the latent period (2) period of maximum rate of growth, or logarithmic period (3) stationary period (4) period of decline. These phases merge into one another without a sharp dividing line and their duration varies with different species of organisms and with the same organism under different conditions such as temperature, nature of culture media and still other factors.

By latent period or lag is meant the interval which elapses between the time of seed up and the time at which maximum rate of growth begins. During this time there may be slow growth, no growth, or an actual diminution of viable organisms. In the present paper the author deals with the nature and significance of this phenomenon.

He advances several views to explain the nature of lag. The fact that bacteria when inoculated into suitable nutritive media, do not immediately increase at the maximum rate of which they are capable, indicates that there is a lack of complete adjustment between the bacterial cell and its environment, and that this discrepancy must first be corrected before rapid growth can ensue. Obviously one of two factors, cell or medium must be at fault. It follows that in order that bacterium and nutritive medium may become completely adjusted to one another a change must take place in one or both of the factors. Lag then, the author states, would represent the time necessary for such a change to be effected.

Keeping these points in mind, the possible causes of lag may be considered under two heads according to whether the medium or the bacterial cell is responsible. In other words, the cause may be extracellular or cellular in origin. The author concludes his work as follows:

Cultures of *diplococcus pneumoniae*, *bacillus coli*, *bacillus sinorensis liquefaciens*, and *bacillus prodigiosus*, when grown in meat infusion broth exhibit an initial latent period when the culture used for inoculation is no longer growing at its maximum rate. If however the culture is growing at its most rapid rate the bacteria, upon subculture show no latent period but continue to multiply at the same rate as that of the parent culture.

If broth cultures of *pneumococcus* are centrifuged at the beginning of the period of maximum rate of growth, the bacteria remaining in the supernatant

fluid continue to grow at a rapid rate upon further incubation. If however the culture is centrifuged at the end of the period of maximum rate of growth, those bacteria which remain in the supernatant fluid show a prolonged latent period, during which many of the organisms die. While the death of these bacteria is taking place the process follows closely the law of unimolecular reactions.

Actively growing *pneumococci* inoculated into the supernatant fluid from a four-day culture of the same strain continue to grow rapidly for an appreciable time after inoculation.

Filtrates from 24-hour cultures of *pneumococcus* inhibit the further growth of actively growing *pneumococci* when the latter are inoculated into such filtrates. This inhibitory action of the filtrates is lost in part as the culture from which the filtrate is obtained is allowed to incubate longer.

Actively growing *pneumococci*, after exposure at low temperatures to the action of the filtrate of a 24 hour broth culture of the same strain, show a greater lag than the controls.

The foregoing facts, the author considers, offer strong support for the view that lag is an expression of injury which the bacterial cell has sustained from its previous environment.

GEORGE E. BRIST

RADIOLOGY

Johns, M. W. Postoperative X Ray Treatment in Malignant Growths, Has It Established Its Value? *Intern. M J* 96 xiii 43.

In the treatment of superficial conditions the roentgen rays have become an established fact and while there are many other methods that may give good results, none have equalled them. Pusey is quoted as having treated 44 cases of cancer of the lip which were followed up after three years with only two failures. In the treatment of those cases where operation has failed or those that have passed the operative stage, while permanent results are rare considerable relief was given, and in some the condition improved to such an extent that operation became possible.

Johns reviews the action of the soft and hard rays and reaches the conclusion that (1) the X-ray acts with greater selective action upon newly-formed malignant tissue with its rapidly forming and developing cells and blood vessels (2) it is also less active upon the older cells of the growth which have persisted for some time and become firmly established (3) surgical removal of the main cancer mass, if possible followed by thorough raying of the more recent cancer-cells and lymphatics, will produce definite results in the shortest space of time. These facts are illustrated by the citation of cases and quotations from various authors. The author believes that the new Coolidge tube technique has greatly widened the field of treatment.

W. S. NEWCOMB

Gullemint, H: *Results of Nineteen Months Experience in War Radiology (Résultats de dix-neuf mois d'expérience sur la radiologie de guerre)* *J de radiol. et d'Elect.*, 1916 li, 225

Discussing the question as to whether it is preferable to have recourse to radiology or radioscopy in the localization of projectiles the author thinks that radiology is preferable for the following reasons:

- 1 Its greater rapidity
- 2 Radioscopy allows the determination of the depth of the projectile being demonstrated on the patient himself also the marking of the findings on the skin without having recourse to calculations or constructions which can be done only at the end of the day when from 10 to 20 patients have been examined

- 3 Radioscopy permits change of the base of search when it is perceived that another is preferable on account of the situation of the projectile

- 4 Radioscopy guides the surgeon even when the patient is on the operating table in the operating line to be selected and even in the course of the operation if the finding of the projectile offers any difficulty

- 5 There are no projectiles discoverable by radiography which cannot be discerned radioscopically with a proper installation.

The author's experience is that most operators who in the beginning used radiography have now adopted radioscopy. In the beginning of the war experience of the working of radiologic installations was lacking. Many were of the opinion that high intensities of 15 to 20 milliamperes were necessary. It was not known then that radioscopy would be much more used than radiography. Now most of the radiologic automobiles work with a medium intensity and employ Chaband tubes and even in fixed installations radiographs are made with 3 or 4 milliamperes of current at most. The heavier cars developing 30 to 40 horsepower which were installed in the early part of the war are therefore no longer necessary.

W. A. BRECKEN

Childs, S. B: *The Present Status of Roentgen Therapy* *Cole Med.*, 1916 xlii, 194.

The results of roentgen therapy especially of deep-seated lesions, have been materially improved since the advent of better apparatus and technique. The three factors contributing most to the improvement are the Coolidge tube, the use of ray filters to protect the skin, and the cross-fire method to increase the dosage.

From a review of the literature and from his own experience the author feels that the following conclusions are warranted:

- 1 In the treatment of superficial epitheliomata the roentgen ray can effect a permanent cure in more than 95 per cent of the cases, and the results obtained are from a cosmetic standpoint superior to those obtained by any other method of treatment.

- 2 In leukemia and Hodgkin's disease a symptomatic cure is greatly enhanced by the use of deep roentgen therapy.

- 3 In uterine hemorrhage in carefully selected cases a cure can be expected in over 95 per cent. At present however deep roentgen therapy seems indicated chiefly in the treatment of uterine hemorrhage in those cases where an operation is undesirable.

- 4 In Graves and Basedow's disease we have in roentgen therapy a remedy which can relieve comparatively early the alarming symptoms in many cases, and if an operation is later deemed necessary the patient will be in better condition to successfully stand it.

- 5 All operable deep-seated cancers with adjacent lymphatic glands, should be thoroughly removed surgically and an area wide of the entire locality should be treated by the most approved methods of radiotherapy as soon after the operation as possible and as thoroughly as though the disease still existed. From the results already reported in the treatment of deep-seated cancers, postoperative radiotherapy can be depended upon to diminish materially the present high percentage of recurrences.

- 6 All patients with inoperable cancer should have the benefit of radiotherapy supplemented by electrocoagulation in cases suitable therefor. Although a permanent cure is not to be expected experience has proved that many brilliant symptomatic cures have resulted, and many persons have been restored to a life of usefulness and comfort for years who otherwise were doomed to an early death. Furthermore in the cases in which a symptomatic cure has not been established the patient has been relieved of pain, foul-smelling discharges have been lessened to a marked degree and the general condition has been greatly improved. It seems within the bounds of safe prediction that with a greater experience in roentgen therapy in this class of cases, results that now seem impossible may be expected.

ADOLPH HARTUNG

Mayo, C. H: *An Appreciation of the Roentgen Ray and a Warning as to Its Use in Surgical Diagnosis.* *Am J Roentgenol* 1916 iii 474.

Brief mention is made of the various uses to which the roentgen ray has been put in a diagnostic way and the value or harm resulting from the interpretation of its findings. The author maintains that the treatment of certain fractures has been almost revolutionized by early diagnosis and aid in adjustment incident to the use of the roentgen ray. Faulty interpretations of bone lesions have been responsible for advising too radical operations. By revealing the location of foreign bodies, it has shown whether surgery is indicated and when necessary preventing over-extensive dissection.

In such disease of the lungs as the early stages of tuberculosis, fibrosis, local bronchiectasis, and cavitations the roentgen diagnosis is more sure and de-

nite than by previous clinical methods. Pleural exudates are readily recognized. Of special importance is the aid the roentgen ray affords in the diagnosis of early metastatic carcinoma of the lungs and bones, thus preventing serious primary or secondary operations when the lesion has progressed to that stage.

In disease of the gastro-intestinal tract it not only renders very definite and positive aid in diagnosis but frequently indicates the proper surgical treatment required. Not infrequently it renders exploratory operations unnecessary by demonstrating the inoperability of the lesion. In an extremely high percentage of cases duodenal ulcers can be diagnosed by its aid. Intestinal tumors, chronic obstruction, dilatation and stasis show remarkably well and roentgenologic findings can be depended on as a means of diagnosis in a large majority of cases. The case with which stomach and colon tumors can be shown with the X ray has done considerable harm in leading to inadvisable surgery by ascribing many ailments to this condition which may be incidental rather than causal.

The roentgen ray offers great aid in the diagnosis of disease of the kidneys and ureters. The presence and location of stones can often be shown and the recognition of multiple calculi undoubtedly lessens the percentage of supposed recurrences. Deformities of the pelvis of the kidney can be outlined by the pyelogram, thus making possible early diagnosis and operation of hypernephroma.

The use of the roentgen ray in cholelithiasis or cholecystitis is considered by the author of comparatively little value, tending merely to corroborate the clinical findings in some of the cases rather than furnishing dependable data for diagnosis.

As a means of locating foci of infection at the apex of the teeth the roentgen ray supercedes all other means of examination.

In conclusion the author urges the roentgenologist to be brief, concise and frank in making his report of findings. The interpretation of these should be properly correlated with laboratory and clinical tests and well taken histories so that the greatest proficiency in clinical diagnosis may be obtained.

ALBERT HARTMAN

Dieffenbach W H. Report on Cancer Patients Treated with Roentgen or Radium Rays and Remaining Clinically Cured After More Than Three Years. *J Am Inst R newsp* 9 6, ix 430.

Dieffenbach reports 16 cases of treated with radium alone one with X ray alone 5 with surgery and radium and one with X ray and radium. The time of observation ranges from 3 to 10 years from the beginning of treatment with good results in those reported. The cases include osteosarcoma of the jaw carcinoma of the uterus, epithelioma of the face carcinoma of the rectum, carcinoma of the breast, cancer of the bladder and epithelioma of the labia. Dieffenbach was impressed with the

fact that a much greater number of recurrent and terminal cases treated by him have succumbed than have been cured. He urges postoperative radiation for malignancy in the prevention of transplantation recurrence and metastasis. Co-operation of the surgeon, physician, and radiologist will in his judgment achieve better result than are at present secured by any one method dogmatically pursued.

CARL R. STEVENS

Stevens, R H. What Evidence Have We of the Value of Pre-operative Roentgen Treatment of Cancer? *J Am Inst R newsp* 9 6 ix, 437

Stevens reports 4 cases of cancer of the penis, 1 lymphoblastoma of the tonsils, 4 cancers of the breast and cancer of the uterus in which X ray was used in the treatment. In only one was X-ray used previous to operation and then the operation was performed as the cancer of the penis grew worse with the X ray treatment. In the others X-ray treatment gave good result either without operation or in recurrence following operation. The cases were all reported before any length of time had elapsed and as Stevens says "What the final verdict will be in these cases time alone will tell." He concludes that the X ray properly used with good modern technique accomplishes favorable results in cancer which have not heretofore been considered possible.

CARL R. STEVENS

Burns, J E. The Use of Thorium in Urology and Roentgenology. *Am J Roentgenol* 9 6 ix 48

After many experimental investigations as to its pharmacologic action and much clinical evidence after a year's experience in its use the author has come to the conclusion that thorium possesses all the qualifications necessary for use as a pyelographic agent. It is non-toxic, non-irritating, quite opaque to the roentgen ray, possesses marked fluidity permitting it to readily escape from the urinary tract, does not stain things with which it comes in contact, and is inexpensive.

The solution of choice was found to be the double chlorate of sodium and thorium together with an excess of sodium citrate and some sodium nitrate. This solution is not bactericidal and molds grow in it upon standing; therefore, it must be sterilized and kept sterile while being used. For pyelograms, a solution containing 5 per cent of thorium in the form noted should be used, and for cystograms a 10 per cent solution has been found entirely satisfactory. 5 to 150 cubic centimeters have been used for the former and 30 to 950 cubic centimeters for the latter.

Regarding the method of introduction into the renal pelvis and ureter, the gravity method is the one generally recognized as least dangerous and most successful. The thorium solution was used in this way in 200 cases in the Urological Clinic of Johns Hopkins Hospital without any untoward effects other than could be accounted for by the required instrumentation or other extraneous factors.

Inasmuch as the thorium solution possesses marked advantages over any other solution used for pycnography the author considers that its great value in urology and roentgenology has been fully established.

ADOLPH HARTUNG.

James L. L. Routine Technique of Barium Dining.
Ann. J. Roentgenol. of 1916 III 477

A detailed description of the routine method of roentgen examination in gastro-intestinal cases as practiced at the Battle Creek Sanitarium is given by the author. In view of the fact that it has given highly satisfactory results in over 8,000 cases it is recommended as a standard technique to facilitate comparison of findings obtained by different operators and thus advance scientific progress in this field of medicine.

Barium sulphate is the contrasting medium of choice inasmuch as it answers all the requirements as regards opacity and has none of the disadvantages of the various bismuth salts which are acted upon by the gastric juice or various putrefaction products which may be present in the intestine. One fourth ounce of the above is first given in one-third glass of water the patient being in the erect position. This is watched as it enters the stomach and passes into the duodenum. Following this an ounce of barium is given in a glass of hot malted nuts and another ounce in a glass of oriental clotted milk, making a total meal of about one pint. The stomach is then watched for peristaltic waves, spastic indrawings etc. The patient is then placed on his right side on the horizontal table pressure is made on the greater curvature toward the pylorus and the patient quickly turned on his back. This permits detailed examination of the filled antrum and duodenal bulb. Four and one half hours later the stomach is examined for residue. If any is present its amount is estimated. A 6 hour limit of normal emptying is set. Another observation is made 9.5 hours after the first meal to estimate the amount of ileac stasis. Twenty six hours after the meal the patient is re-examined to determine conditions in the colon and at 50 hours again to furnish data on colonic stasis. If considerable residue still is found further observations are made at 74 or even 98 hours.

As regards the giving of cathartics or enemas preliminary to the above examination this is indicated with the view of obtaining as nearly natural conditions at the time of observation as is possible. The patient is instructed to take no food or drink immediately preceding the opaque meal nor for several hours afterward until the stomach is emptied of this meal. No laxatives nor enemas are to be given until all observations on the meal are completed.

Following the examination of the gastro-intestinal tract with the opaque meal the patient is prepared for the injection of the opaque enema. The bowel is cleaned by three small warm enemas given at fifteen minute intervals at least two and not over

three hours before the barium injection. An ordinary rectal tube is used inserted just past the sphincter. The enema consists of a warm mixture of barium and gum tragacanth. Before injecting the abdomen is examined fluoroscopically for possible residues in the appendix or diverticula. The enema is watched at intervals as it flows in for possible obstructions, spasticity, mobility, ileocecal incompetency etc.

This completes the examination and gives all the information available from any routine method.

ADOLPH HARTUNG

MILITARY SURGERY

Bauer F.: Shell Injuries in the Present War
(Leber Schusslaktionen im gegenwaertigen Krieg)
T. VI. North. Surg. Cong. Goeteborg 1916 July

The author who had occasion to work in the reserve hospital at Belgrade during the second Balkan War during the present war in Vienna, and in other base hospitals and further visited a series of base hospitals gives a short review of the experiences obtained.

1. Shell wounds are serious because a greater percentage of them are infected than formerly and frequently severely infected. The reason for this is that artillery wounds predominate.

2. It is necessary to operate early in most brain injuries and so-called *Steckschuesse*.

3. Most bullet wounds of the thorax are to be treated very expectantly.

4. In all cases of penetrating wounds of the abdomen it must seriously be considered whether the operation will not give the patient a greater chance than the expectant treatment. Numerous excellent results have been secured where operation was performed during the first few hours after the injury even if the conditions for operation were not always ideal.

5. The ideal treatment for lesions of the extremities is to quickly remove all extraneous matter from the wounds, remove all loose fragments, put on a sterile dressing and a good fixation bandage and send the patient out of the war zone.

6. The transport system must be perfected to the minutest detail.

7. It is absolutely essential that competent surgical men be retained at the front even in the most advanced hospitals and dressing stations.

Since it is not very probable that bullet wounds will become less surgical in future wars it is essential that in the organization of military hospitals the last mentioned requirement be heeded.

L. A. JENSEN.

Wallace C.: Gas Gangrene as Seen at the Casualty Clearing Stations. *Brit. M. J.* 1916 II 381

Wallace reports eleven cases of gas gangrene and records some very interesting opinions in regard to the condition.

From the clinical study of his cases and from the

postmortem study of fatal cases and of ablated portions of limbs he receives the following impressions:

Gas gangrene is a disease of the muscles, the infection being rarely met with without a muscle injury and advancing farther in the muscles than in the intermuscular areolar spaces.

The lesion in its early stages is a longitudinal one running up and down the injured muscles from the seat of the lesion. The muscles first affected are the injured ones, and direct extension to an intact muscle is rare, so that it is unusual to find all of a segment of a limb affected unless the main blood supply has been cut off.

There is but little tendency for the infection to pass from one muscle to another except when the pressure becomes sufficiently great to interfere with the blood supply to the adjoining muscles and thus renders them easy prey to the infection. Muscles contained in rigid compartments are especially prone to die if wounded.

The muscles become resonant from the presence of gas long before they become crepitant to the finger and, although crepitation is a comparatively late phenomenon being due to the escape of gas into the areolar and subcutaneous tissue crepitation may be perceptible at an early date by means of the stethoscope.

A vascular lesion insufficient to cause death in an uninjured limb will be followed by the death of the muscle in an infected limb.

It seems that both the bacterial toxins and the gas play a part in the death of the muscle. The gas advances between the muscle-fibers ahead of the infection and interferes with the blood supply to the muscles thus rendering them more susceptible to the toxins.

The microscopic appearance of muscle dead from cutting off of its blood supply is different from that of a muscle dead from infection. Such an examination shows the bacteria to be between the muscle-fibers and not within them.

The conclusions as regards treatment are:

1. The circulation should always be preserved when possible and should be helped in every way. Tension from effusion or from gas by free incision should be relieved. Important vessels should be sutured and preserved if possible.

2. Incision or ablation of the wounded muscle is often sufficient to arrest the disease as it is usually only the wounded muscles that become gaseous.

3. When gas gangrene occurs in a segment of a limb distal to the wounded segment it nearly always means that the main artery is blocked and amputation of the gangrenous segment is the only course.

4. The presence of crepitation apart from other signs is of no special importance. The state of the muscles and the number of dead muscles should be ascertained before amputation is performed, otherwise a limb or a very considerable portion of its length may be sacrificed unnecessarily.

J. W. TURNER.

Seefisch G: The Open Treatment of Wounds in War (Zur Frage der offenen Wundbehandlung im Kriege). *Beitr. z. klin. Chir.* 96 c. *K. Leipzig* 1917, 9.

In discussing the treatment of war wounds Seefisch states that he does not wish to discuss asepsis or antiseptics neither does he wish at present to criticize the various procedures advocated by Wright, Delbet, Carrel and Dakin, as observations as to the value of such methods are not sufficient to warrant conclusions just yet.

Seefisch's object is to weigh the general advantages and disadvantages of the open treatment of wounds in the light of his own personal experiences as director of a large clearing hospital.

Attempts have been made to give open wound treatment a scientific foundation and to deduce practice from the theory. Seefisch intentionally avoids theoretical considerations, and confines himself entirely to the region of practice. In war surgery nothing but practical measures count, and the surgeon can act only according to the conditions present. Here more than elsewhere a successful result is the only valid standard for the employment of a method. Seefisch derives his experiences from large hospital material, mostly seriously wounded patients. In this hospital the open method of treatment had already been in use for some time and with extra care and skill had been brought to a great degree of perfection.

At Seefisch's first visit to this station he was favorably impressed by the open treatment method, but decided that it would be best to form his judgment from the results of primarily unselected applications of the method. In spite of the favorable exterior conditions and in spite of his own favorable attitude toward it, Seefisch could not convince himself after several weeks of daily experience that the open wound treatment was any real advance or that it had a future before it. The advantages claimed by those who advocate the open treatment of wounds are: (1) discontinuance of tampons and drainage; (2) avoidance of painful changing of dressings; (3) quick abatement of fever; (4) good granulation; (5) avoidance of the bad odor of wounds; (6) effective struggle against the bacillus pyocyaneus; (7) favorable influence on gas phlegmons; (8) restricted use of dressings; (9) less work for the staff.

Seefisch considers each of these claims and as a rule does not find that they can be supported. As regards tampons and drains he thinks that in practice these are actually used by the advocates of the open method and that in order to avoid the slowness of epithelization by the open treatment those same advocates are using salves and dressings. There is no proof that either bacillus pyocyaneus or gas phlegmons are better combated by the open treatment than by the older occlusion methods.

The final conclusions of Seefisch are: The open wound treatment has no important advantage over the occlusion bandage and cannot be described as a

radical solid progress in the technical treatment of wounds. The advantages of the method are preponderatingly of an external nature. Only in certain kinds of wounds such as wounds in the anus and in the bladder has open treatment a really higher value. Open treatment has, however numerous disadvantages, the most pronounced of which is the very much delayed slower recovery of the wounds with a consequent injurious effect upon later functioning.

The advantages offered by this method are not great enough to balance the disadvantages. Seefisch does not therefore believe that it has a future but would accord to it the character of a help in an emergency. It is not necessary to change our views concerning the suitability of drainage and the discharge of complicated wounds. The sovereign method of the treatment of wounds upon the battle field is and remains, according to Seefisch's conviction, the professionally and carefully applied occlusion bandage watched by experienced assistants. Fixation as taught by von Bergmann remains the strongest weapon in the fight against wound infection.

W. A. BRENNAN

Sencert, L., and Grand J. le: Primary Extraction of War Projectiles (De l'extraction primitive des projectiles de guerre) *Lyon chir* 1916 xlii, 537

The authors state that today there is a consensus of opinion as to the necessity of immediate operation on all war injuries except in the case of perforating bullets having left only two small orifices. Especially is there agreement as to the necessity or at least as to the very great utility, not only of opening up the wound, but extracting the projectile. Such complete operation should always be done if the surgical means are at hand and there is no contra indication. The practice adopted in the authors' ambulance service for many months past is immediate operation for every penetrating wound with an included projectile where there are no contra indications.

Of all methods of localizing and extracting projectiles the authors prefer surgical extraction under the guidance of the radioscopic screen and they think it superior to radiographic or other methods. They think that the advantages claimed for radiography i. e. that it does not expose the surgeon to the harmful influence of X rays and that it does not necessitate a specially darkened operating chamber, have no real weight as both can be obviated and are more than outweighed by the advantage of the surgeon having the picture of the projectile immediately under his gaze in removing the projectile. From their experience of both radiography and radioscopy the authors have reached the conviction that the latter is simpler easier and more surely and rapidly efficacious.

They have attempted 357 extractions of projectiles by this method and all have been successful. These included 52 extractions from the upper

limb 168 from the lower limb 23 from the thorax and 14 from the head.

The conclusion which the authors finally arrive at is that excluding very small projectiles deeply embedded in the muscles or bones and not giving trouble encephalic projectiles not accessible by the wound and for the time being intrapulpary projectiles all other projectiles ought primarily to be removed immediately on arrival at the ambulance if there is a good radiologic and surgical service. The preference is given to the extraction under the intermittent control of the radioscopic screen.

W. A. BRENNAN

Hesse W.: Fibrolysin in the Surgery of War and Its Dangers; Remarks on Fibrolysin Anaphylaxis (Fibrolysin in der Kriegschirurgie und seine Gefahren nebst einem Anhang ueber die Fibrolysin anaphylaxe) *Arch f Klin Chir* 1916 cxvii 72

Hesse reports on the use of fibrolysin in war surgery. This substance, which is formed by the chemical union of thioanilin and sodium salicylate was first prepared by Mendel in 1904. It has been extensively used in Germany in cleared healed gunshot wounds when the scar tissue interfered with function as it effects a softening of the scar. According to Hesse its use is indicated in (1) motor disturbances in various joints, when such are the consequence of a shrinkage of the soft tissues, or due to a coalescence of the soft tissues with bone or a cicatricial coalescence of sinew and muscle groups with inhibition of their individual motility, (2) in scars which are sensitive to pressure (3) in disturbance of blood circulation due to cicatrization (4) and in certain pleural growths.

Within the range of these indications favorable results were noted in only about 30 to 50 per cent of the cases. Fibrolysin is contra indicated as long as there is the possibility of latent virulent pus production in the scar as under such circumstance there is likely to be a renewed inflammatory process within the scar. In three cases of this description two deaths resulted. It is however by no means easy to detect the presence of latent pus in the scar and it may be easily overlooked, owing to the absence of clinical symptoms. The age of the scar does not exclude the possibility of a virulent pus producer within it. In cases observed by Hesse in which injections of fibrolysin were made directly into the scar the presumption was justified that it was the cause of a tempestuous infection and fatal issue. It is therefore a safe rule never to inject fibrolysin into the scar itself. Sometimes disturbances of the general condition of a toxic nature are observed which are a sequence of increased scar tissue development. As a consequence there is flooding of the blood with albumin as a by product which is explainable by anaphylaxis. Such anaphylactic symptoms are not an indication against continuation of fibrolysin treatment they are rather prognostic of a favorable result of the therapeutic success of fibrolysin as they are the expression

of a lively development of scar tissue. The absence of anaphylactic symptoms is the expression of deficient development of scar tissue.

W A BREWMAN

Courtois-Suffit, M., Giroux, R and Fernan
Widal Prevention of Tetanus Paris Masson
t Cie. 96

The prevention of tetanus continues to receive the attention of writers on military surgery and it is safe to state that the control of this deadly complication of war wounds by prophylactic injections of antitoxin will be regarded as one of the great triumphs of preventive medicine in the present world war.

This little book deals with the forms of tetanus as observed and treated in the earlier part of the war. It deals also with the abnormal forms of the disease as noted and much better understood at the present time forms that are far more frequent than most surgeons suspect. The atypical varieties of tetanus referred to are those with manifestations of the disease confined to the head and others in which the affection is confined to the limbs.

The cephalic forms are those (1) with involvement of eye muscles and (2) those in which the hypoglossal or other cranial nerves may be involved. In the localized forms affecting the limbs the affection may be monoplegic or paraplegic there are other forms in which muscles of the trunk alone are involved.

In the preface Professor Widal calls attention to the emphasis which the authors place on what they style tetanus of incomplete immunization. They refer to the atypical and partial forms of tetanus as a result of insufficient vaccination with antitetanic serum in the same way that we refer to cases of attenuated typhoid fever from insufficient dosage with serotherapy. The atypical forms mentioned point to the necessity for further dosage in the clinical history of these tetanus cases. The authors are insistent on timely and sufficient prophylactic injections in war wounds as the only trustworthy method of preventing tetanus.

Sir William Osler reports that he has seen 9 cases of so called local tetanus since his attention has been called to the subject. According to him the cases fall into three groups (1) local spasm of a limb preceding by several days the onset of severe tetanus (2) true localized tetanus confined to one limb or to a group of muscles, or to both legs (recovery is the rule in such cases) (3) pseudotetanus.

Osler warns us that every muscle spasm following a wound is not tetanus. At one of the consultations the practitioner mentioned a case of supposed tetanus. The notes stated that the spasms in one leg began immediately after a scratch received from a wire and the description given by the nurse suggested a form of functional spasm. Another patient had clonic spasm in one leg varying with posture and much magnified when wrenched. The case was finally put down as a neurosis. Sir William

states further that possibly these are cases of the reflex spasm associated with wounds, such as are described by Babinski.

Last August a memorandum on tetanus was issued by the war office committee on the study of tetanus which formed a guide to all surgeons in the British army for the prophylactic treatment of tetanus. A revised circular has recently been issued on the same subject by a special tetanus committee. The prophylactic injection of antitoxin is now the rule in all war wounds, and although there are cases still occurring the disease is now seen in small numbers.

According to the circular there is strong experimental evidence that the immunity conferred by a primary injection of antitoxin is lost in about ten days. For that reason it is considered advisable to give a second subcutaneous injection in all septic wounds at the end of seven days and further in wounds following a chronic course, caused by shell injuries or bombs, a third and fourth injection should be given at intervals of seven days.

The danger of anaphylactic shock is said to be negligible when prophylactic doses of 500 U. S. A. units contained in 3 ccm. of horse serum are administered subcutaneously whatever the interval after the preceding injection.

Dosage in prophylactic or preventive treatment of tetanus. The memorandum recommends that the primary dose be given at the dressing station, and the subsequent doses at home hospitals. The ordinary vial contains 500 units of tetanus antitoxin, of which one-third should be administered subcutaneously to each wounded man. The serum is aseptic and, moreover, it contains an antiseptic. It is not necessary to sterilize the syringe after each injection, but a freshly sterilized needle should be used for each case.

Precautions to be taken before operating on wounds. When about to operate on the site of a wound, although the latter be healed unless the previous dose has been administered at a shorter interval than seven days, a prophylactic injection should invariably be given before operation. The precautionary injection should consist of a single subcutaneous injection of the ordinary prophylactic dose of 500 units administered two days before operation and preferably intramuscularly. It takes 48 hours for the antitoxin to be absorbed when administered subcutaneously and twelve hours intramuscularly.

Precautionary injection before operation is necessary to ward off the possibility of lighting up dormant tetanus bacilli that may be buried in living tissues that are indifferent to their growth. It should be remembered that the anaerobes, like tetanus bacilli which are saprophytic in habit may live without propagating in clean wounds for two and three months without exhibiting the clinical manifestations of the diseases which they cause when located in devitalized tissues. Hence the reason for precautionary prophylactic dosage to

be employed when about to operate at the site of a wound

The memorandum next deals with the antiseptics used in the preventive treatment. It is well known that anaerobes grow with much difficulty in the presence of oxidizing agents like hydrogen peroxide, potassium permanganate, chlorine, and solution of iodine and for that reason clinicians have sought to treat the infection locally by irrigation and by injecting into the tissues weak solutions of these agents. The results have not been satisfactory.

Diagnosis The classical symptoms of tetanus such as trismus, risus sardonius, opisthotonos, etc., in those who have been treated by prophylactic injections of antitoxin are very seldom seen. The clinical evidences of tetanus are confined to local spastic rigidity of the wounded part or limb which may persist for weeks.

The importance of early diagnosis is emphasized since all clinical and experimental evidence goes to show that successful treatment diminishes rapidly with the length of time after the first symptoms have been observed. Among the earliest symptoms of tetanus are spasticity and increased reflex excitability of the muscles near the wound. In these cases the toxin reaches the spinal cord primarily by the nerves which are connected with the seat of injury and therefore the motor nerve-cells which govern the muscles about the wound will be the first to be affected. Spasticity and rigidity may precede the other symptoms of tetanus by many hours. For this reason, the assistants and dressers are enjoined to report to the surgeon in charge, the first occurrence of rigidity, twitching or local increased reflexes which may be provoked in response to gentle tapping or pressure. Other early symptoms of diagnostic value may be an anxious look, pain in the back or neck, sore throat, general restlessness, unreasonable outbursts of temper, insomnia, violent headache, excessive yawning, complaints of spasms in the limb injured, stiff neck, difficulty in swallowing without recognizable cause, stitch in the side, profuse local or general sweats and difficulty in micturition.

Therapeutic or curative treatment of tetanus Success in therapeutic and curative treatment after the onset of symptoms depends on properly administered intrathecal injections of antitoxin given as soon as possible after the first symptom has been noted. An hour's delay may mean the difference between success and failure. Rigidity and hardness of the muscles around a wound may be present for days or weeks before the occurrence of trismus. When the rigidity appears it will not do to employ the slow method of absorption of the antitoxin by the subcutaneous or intramuscular method. An intrathecal injection should be made as follows.

The patient should preferably be under a general anesthesia. The skin over the area of the fourth and fifth lumbar spines should be painted with iodine or cleansed with soap and water followed by an antiseptic. A spinal needle and a 20-ccm syringe

should be boiled in normal saline and the surgeon must observe throughout the most rigorous aseptic precautions.

The patient is bent head to knees so as to present as fully a curved back to the operator as possible and the position of the fourth lumbar spine ascertained by drawing an imaginary line between the crests of the ilia.

The tip of the finger is placed on the supraspinous ligament connecting the summits of the spinous processes of the fourth and fifth lumbar vertebrae. The needle is inserted about three-eighths of an inch to one side of the middle line and directed forward and slightly upward and inward. If the needle strikes the bone it should be withdrawn and a fresh attempt made. The canal is reached at a depth on an average of about 2.5 inches. The trocar is withdrawn and about 20 ccm. of cerebrospinal fluid allowed to flow out into a measured vessel. The syringe is then fitted to the needle and the serum injected. It is important that the serum be heated to the temperature of the body and the injection made very slowly.

The canal can also be reached by pushing the needle through the supraspinous ligament in the middle line halfway between the two spinous processes. If several injections are to be made it is well to choose fresh sites. Blocking of the flow of the cerebrospinal fluid by a blood-clot may be overcome by reinserting and withdrawing the trocar.

The bed should be tilted at the foot and the pillow removed for an hour or two after the injections. The foregoing direct attack on the toxin in the neighborhood of the central nervous system should be supplemented by intramuscular injections in order to neutralize any toxin in the blood and to prevent any more of it being taken up by the nerve endings in muscles. Subcutaneous injections may be practiced later to keep up the antitoxic quality of the blood.

Intravenous injections are not recommended because of the danger of anaphylactic trouble which is prone to occur after this mode of administration.

Dosage in the therapeutic or curative treatment of tetanus The value of the curative treatment by antitoxin lies in the administration of large doses. The intrathecal injection should correspond in bulk to the amount of cerebrospinal fluid withdrawn which as a rule should not exceed 20 ccm., and in cases where little or no fluid is drawn off the amount of serum injected should never be more than 20 ccm. and this should be injected very slowly.

If the serum is of the strength of 150 units in 1 ccm. the patient will then receive a dose of some 3,000 in 20 ccm. When the serum is of higher potency—say 800 units to the ccm.—the patient will receive 16,000 units. The high potency serum is always preferable for intrathecal injections. At the same time that the intrathecal injection is given from 5,000 to 10,000 units should be injected

Intramuscularly and 3,000 to 5,000 mg. also be given subcutaneously.

The Intrathecal injections may be repeated daily for three to five days and the intramuscular and subcutaneous may be continued daily or oftener according to the severity of the symptoms.

The following table is given as an example of the serum treatment which has been employed in early and well marked cases.

| Day | Subcutaneous | Intramuscular | Intrathecal |
|---------|--------------|---------------|-------------|
| First | | 1,000 | 5,000 |
| Second | | 1,000 | 4,000 |
| Third | | 500 | 3,000 |
| Fourth | | 000 | 1,000 |
| Fifth | 000 | | |
| Sixth | 000 | | |
| Seventh | 000 | | |

In addition to the specific treatment above noted, the memorandum includes symptomatic treatment which consists of the administration of sedative drugs. The most stable is morphine one-quarter grain every four hours, and next potas-

sium bromide chloral chloralose, and paraldehyde given by the mouth or rectum. Carbolic acid, and magnesium sulphate have only transitory good effects in curtailing spasms, they have no curative effect.

Surgical treatment of the wound. To amputate a limb or excise the wound in a case of tetanus is not looked upon with favor. They are of no avail, and clinical as well as experimental evidence points to possible dangers from over interference.

The memorandum recommends that experts in tetanus be detailed to assist in the treatment of all cases. These officers should be near at hand, and promptly notified as soon as a case is suspected. They are to supervise the recording of cases and report upon any abnormality of behavior of the antitetanic serum used. The special committee referred to in the beginning of the memorandum solicits the co-operation of all medical officers in a collective investigation and we have great confidence that their labors will continue to bring forth clink evidence of value. LOUIS A. LA GARDE.

GYNECOLOGY

UTERUS

Jacobson, J. H.: Recent Progress in the Treatment of Uterine Cancer. *J Am M Ass* 1916 lxvii 1210.

In early or operable cases of uterine cancer the best results are obtained from the radical abdominal operation.

Owing to the difference in malignancy of uterine cancer the type of cancer present should be determined whenever possible. Cancer of the vaginal portion and of the body of the uterus should be treated preferably by operation.

What shall be done with the borderline cases is to be determined by the operator's judgment and his experience with the radical abdominal operation.

Until radium roentgen ray or Percy's operation have proved their superiority to established methods of surgical treatment, their use should be restricted to the inoperable cases.

A combined form of treatment, that is operation with radiotherapy is a method of demonstrated value. Systematic irradiation with roentgen ray or radium should follow every palliative or radical operation for uterine cancer.

EDWARD L. CORNELL

Berkeley C. and Bonney V.: The Radical Abdominal Operation for Carcinoma of the Cervix. *Uter. Brit M J* 1916 li, 445.

This report is based on one hundred cases with results from the viewpoint of absolute cure or five years freedom from recurrence.

The operation consisted in the removal of the uterus with the cervix contained in a bag formed of the upper half or two-thirds of the vagina, closed by a clamp specially designed also removal of ovaries, fallopian tubes broad ligaments parametric and paravaginal tissue down to the upper surface of the levator ani and the glands and cellular tissue occupying the obturator foramen and investing the external and internal iliac arteries and veins. The ureters were entirely isolated throughout the anterior two-thirds of their pelvic course and some times part of one ureter was resected and the upper end implanted in the bladder. Sometimes a portion of the bladder was excised when not separable from the cervix, and where carcinomatous glands about the external iliac artery and vein existed dissection was even extended to the bifurcation of the aorta.

The one hundred cases consisting of those up to the borderline of operability had the following results

| | |
|--------------------------------|-----------|
| Died of the operation | 20 |
| Died of recurrent growth | 32 |
| Died of other diseases | 2 |
| Lost sight of | 7 |
| Cured at the end of five years | 39 |
| | <hr/> 100 |

C. J. STAMM.

Deaver J. B.: Operative Treatment of Fibromyomatous Uterine Tumors. *J Am. M Ass* 1916 lxvii 1216.

General interest in the question of the treatment of myoma of the uterus has been rekindled by the enthusiastic claims of advocates of the roentgen ray and radium treatments. Surgery has fought and won the battle against the old ideas of the harmlessness of the majority of these uterine growths showing that in many cases they take on activity after a period of quiescence that they undergo malignant degeneration, that they may produce harmful pelvic and abdominal lesions, that they predispose to carcinoma of the uterus, that they produce a variety of harmful pressure effects and in short that any given series of women who are the subjects of these growths will in time show a large percentage who suffer from one or more of a great variety of complications that are more or less disabling or dangerous to life.

Now we are confronted by radium treatment for which more extended claims are made, and we are asked to believe that it will not only control the symptoms, but also cause a disappearance of the growth in many instances. It is obvious that a considerable time must elapse before the radium treatment can be stamped with the final verdict of history. A patient treated with radium, even though symptomatically improved still has her fibroid for the claim that such tumors disappear under the influence of the radiations cannot be taken seriously.

In the author's opinion, we are now justified in asserting that both the roentgen ray and radium have failed to demonstrate specific power over fibroid growths and therefore, must be placed in the category of symptomatic forms of treatment which accomplish good results in occasional cases, like the use of corrosive plaster in epithelioma but when used as a measure of general applicability will do great harm in causing delay of the radical treatment and exciting false hopes of non-operative cure that may deprive many of proper treatment. In all cases the treatment is expensive and often tedious. It does not safeguard against future trouble. There is no reason to believe that it can abolish the well

attested toxic effect of certain myomata on the heart and possibly other organs.

The operation for fibroid tumor of the uterus has been one of the most satisfactory in all surgery. If performed on operable patients at a timely season the mortality is exceedingly low, the results being almost uniformly good. When cure is indicated, symptomatic treatment has no place.

In the last 750 operations there were 68 supra-vaginal amputations of the uterus without removal of the tubes and ovaries, 325 supravaginal amputations of the uterus with removal of both tubes and ovaries, and 145 supravaginal amputations with partial removal of the tubes and ovaries. There were 99 complete abdominal hysterectomies, 20 vaginal hysterectomies, and 93 abdominal myomectomies. The mortality was 1.73 per cent.

EDWARD L. CORWELL

Tracy S. E.: A Report of One Hundred Consecutive Cases of Fibromyomata Uteri Subjected to Operation. *J Am Med Ass* 9:6 April, 1913.

The author's paper is based on his first 100 consecutive cases of fibromyomata uteri subjected to operation.

Malignancy in the pelvic organs and degenerative changes in the tumor were found as per the following table. These took place in 31 patients, which is double the percentage usually reported.

| | |
|---|---|
| Calcareous infiltration | 2 |
| Carcinoma corporis uteri | 7 |
| Carcinoma cervicis uteri | 2 |
| Carcinoma of ovary with extension to uterus and sigmoid | 1 |
| Hyaline degeneration | 1 |
| Myxomatous degeneration | 1 |
| Necrosis | 6 |
| Sarcomatous | 1 |

Of the 100 patients, 63 were married, widowed and 36 single. Of the 74 who were or had been married 54 or 73 per cent had borne children.

The surgical procedures carried out in these cases consisted of supravaginal hysterectomies 64, pan-abdominal hysterectomies 20, vaginal hysterectomy 1, abdominal myomectomies 9, vaginal myomectomies 6. In every case of known malignancy suspected malignancy and extensive laceration of the cervix, a panhysterectomy was done unless there was some contra-indication. Besides the operative procedures enumerated, several of the patients had plastic work done at the time the tumors were removed. One case had a plastic operation, a shortening of the round ligament and an appendectomy in addition to the myomectomy.

The primary mortality was 2 per cent. One case that of a pale, weak patient did well the first four days, when her special nurse gave her a bath on a winter's day with the windows wide open. She promptly developed a double pneumonia and died on the eighth day. Another patient developed renal insufficiency and died 52 days after operation. She had recovered from the operation but remained at

the hospital for medical treatment, as she died in the institution, the fatality is included in the series.

In reviewing the results of the cases subjected to hysterectomy one of the most important factors from the standpoint of the patient is the amount of suffering from the artificial menopause. The patients were questioned closely as to these symptoms and every effort made to classify them accurately. The degree of the menopausal symptoms has been divided into five classes as follows: no symptoms, very mild, mild, moderately severe and marked.

Of the patients subjected to hysterectomy in 72 the menstrual function was still active. Of these, in 2 one or both ovaries were allowed to remain, in 6 both ovaries, in 4 the right, in 3 the left, 5 are dead, 7 cannot be traced, which leaves 43 traced patients who had both ovaries removed. Of these 43 cases, 0 or 18.7 per cent had no menopausal symptoms, in 8 or 68 per cent the symptoms were very mild, in 30 or 41.6 per cent, the symptoms were mild, in 7 or 14.5 per cent, the symptoms were moderately severe, and in 4 or 8.3 per cent the symptoms were marked. In 77 per cent of the cases the disturbance as a result of the artificial menopause varied from no symptoms to mild discomfort.

Of the 12 patients in whom one or both ovaries were allowed to remain, 0 have been traced. In 5 or 50 per cent, there were no menopausal symptoms, in 2 or 20 per cent the symptoms were very mild, in 1 or 10 per cent the symptoms were moderately severe, while in 3 or 30 per cent the symptoms were marked. These two patients were pronounced neurasthenics before the operation and after operation they complained greatly of the menopausal symptoms. Their physical condition is good and they have been cured of all symptoms caused by the tumors. They would no doubt have complained to the same extent had they gone through the natural menopause.

Of the 78 patients alive and traced, the results have been as follows: One patient, while cured of the pelvic lesions, had an infection of the incision with resulting hernia. One patient after a plastic operation a myomectomy an appendectomy and a shortening of the round ligaments, continued to have metrorrhagia which was controlled by roentgen-ray treatment and is not considered a surgical cure. The combination of treatments was ideal. There was no excuse for a hysterectomy which would have controlled the bleeding as the tumors were small and the patient comparatively young. On the other hand, the roentgen rays would not have cured the lacerations, the displacement, or the chronic appendicitis. One patient is well except for so-called chronic rheumatism. One patient, a marked neurasthenic, has a cystitis and claims she is no better than when bedridden with a pelvis and lower abdomen filled with a fibromyoma and a bilateral femoral phlebitis from pressure. The remaining 74 are well and enjoying good health. To these should be added as cured of the pelvic

trouble, the one who had rheumatism making a total of 75 or 96 per cent cured. From the 75 3 who are now in good health, should be held under advisement as they had a malignancy of the uterus associated with the fibromyomata.

EDWARD L. CORWELL.

Boldt H. J.: Chloride of Zinc in Uterine Hemorrhage. Particularly When Caused by Uterine Myomata and Metro-endometritis. *Tr. South Surg. & Gynec. Ass.* White Sulphur Springs, 1916 Dec.

The author does not approve of the removal of the uterus for bleeding if it be not the seat of a neoplasm. He acquired an extensive experience with the treatment which he advocates in treating patients who declined surgical intervention.

In the beginning of his work he experimented with varying strengths of carbolic acid solutions applied intra uterine used by means of an intra uterine applicator syringe. It differs somewhat from the Braun uterine syringe by having a very thin even silver tip four to five inches in length with only a terminal opening. The tip before being wrapped with a strip of gauze, is smeared with ordinary vaseline, to allow of the easier slipping off of the gauze which is to be left in the uterine cavity thus making an intra uterine medicated tampon.

If the bleeding is not too profuse a 10 to 20 per cent solution of carbolic acid in glycerine is used if that is ineffectual pure carbolic acid is made use of. The barrel of the syringe is filled with the desired medicament the tip smeared with vaseline and a strip of gauze, one to two inches wide and 12 to 24 inches long or longer according to the size of the uterine cavity wrapped around the tip when inserted into the uterus a few drops of the solution are injected into the gauze, the tip partly withdrawn and more gauze packed into the uterus. The process is continued until the cavity is filled with medicated gauze. The remainder of the gauze is then tightly packed into the cervical canal with an ordinary smooth uterine applicator. A string is attached to the terminal end of the gauze to permit of the intra uterine tampon being removed by the patient. A large tampon of absorbent cotton is placed in the vagina. If carbolic acid has been used the tampon may be removed after a few hours. But if chloride of zinc has been used it should remain in contact with the interior of the uterus about three days. Chloride of zinc is used in all cases of severe bleeding whether due to metro-endometritis or simple endometritis but particularly when caused by interstitial myomata of small size. For large tumors it is more desirable to extirpate them. Boldt uses a 50 per cent solution of chloride of zinc more frequently than weaker solutions. Care must be taken to prevent the medication coming in contact with the cervical mucosa lest a stricture result.

In several instances of very profuse bleeding from interstitial myomata some measuring about six

inches in diameter in women past 40 years of age he has seen complete amenorrhoea established after using twelve or even a less number of chloride of zinc applications. While the tumors did not decrease in size the health of the patients improved as the result of amenorrhoea.

There must be no oozing of blood from the endometrium when the intra uterine applications are made—the uterine cavity must be dry. If it is not it may be dried with an intra uterine tampon of styptic gauze.

Carbolic acid applications should be made at intervals of three or four days during the interval of menstruation. When 50 per cent of chloride of zinc is used one application during the interval of menstruation usually is sufficient.

Robins C. R.: The Pathologic Uterus at the Menopause. *Tr. South Surg. & Gynec. Ass.* White Sulphur Springs, 1916 Dec.

In a series of cases requiring hysterectomy 58 occurred in women forty years old and over and in all of these the complete removal of uterus and adnexa was performed. In 28 of these cases the operation was performed for fibroids and other conditions where the possibility of conserving the organs was manifest and beyond dispute. In the remaining 30 cancer was either a positive or possible diagnosis. In 4 of these, positive cancer of the cervix was present and the Wertheim operation preceded by cauterization was done. In 26 cases a diagnosis of chronic metritis including induration of the cervix, was made and a possibility of cancer considered. In practically all of these cases bleeding was a prominent symptom. In 2 cases cancer of the fundus was found after the uterus had been removed and opened up. After considering the difficulties and danger of making an exact diagnosis of cancer in its incipency the following conclusions are reached:

1. In cases favorable for cure from operation it is not always possible to make an exact diagnosis.

2. In an effort to make the diagnosis exact one is liable to lose the advantage of an early operation by an attempt to secure tissue for examination in this way disseminating cells and stimulating vicious growth.

3. A pathologic uterus is potentially a malignant one and even if cancer is not already present it may develop later.

Robins therefore believes that the line of safety requires that in those cases occurring in women about the menopause or where the symptoms and physical findings would suggest the possibility of malignancy that the procedure should be total extirpation of the pelvic organs and a pathologic investigation made after the organs have been removed. In 26 such cases cancer was found in 2 or slightly less than 8 per cent.

In addition to the consideration of cancer there are other excellent reasons why the uterus should be removed. The symptomatology is pronounced

enough to require treatment. It has usually existed for a long time and become fixed so that conservative measures are liable to be disappointing in results. The organs have fulfilled their usefulness and removal is only anticipating nature by a short period. Conservative operations are often multiple and time consuming and succeed only in saving something that the patient is better off without and in bleeding uterine conservative measures as curettement often do not relieve. The burden of proof is then to show why such a uterus should be saved. His experience has been that mortality is probably less in hysterectomy than in multiple operations and the patients have been uniformly benefited. He concludes finally:

Total abdominal hysterectomy is the operation of election in the pathologic uterus at the menopause. In an appreciable number of such cases, necer will have been found to have already developed.

The adoption of radical methods in dealing with such cases offers the surest protection to women from cancer.

Piccardo, T. J. Uterine Retrodeviation (Retrodeviaciones uterinas). *Pres. med. Argent.*, 9 6 III, 3.

The author draws attention to a modification made by Caballero in the uterine ligamentopexy of Doleris. This procedure of parietal fixation, according to some operators, causes the creation in the abdominal cavity of a narrow foramen between the uterus, the ligaments, and the walls, in which an intestinal loop might become strangulated. Caballero's modification is made with the object of obviating this disadvantage while preserving the advantages of the ligamentous fixation. The modification consists in making the ligamental fixation outside the rectus and more around the internal orifice of the inguinal canal thus giving plenty of room and avoiding the possibility of an internal hernia.

The author does not believe that there is any ground for the criticism offered against parietal fixation, i.e. that there is danger of injuring the epigastric artery which runs parallel to the external edge of the rectus muscle. He moreover thinks that the Caballero modification fills the two essential conditions of intraparietal neo-insertion: it gives a sufficiently ample pre-uterine space and a very slight amount of abdominal uterine luxation.

W. A. BRYMAN

Norris, C. C. Syphilis of the Body of the Uterus. *Surg. Gynec. & Obst.*, 9 6 xxiii, 68.

A common form of syphilitic endometritis manifests itself by changes in the glands and stroma, the latter being chiefly involved. It is characterized by changes in the blood-vessel walls and condensation of the stroma. Exactly how frequently this condition exists is not known. Ulceration of the endometrium is not infrequent and resulting scars may also be observed. This is particularly likely

to result during the tertiary stage. Gummata are also reported.

Lesions of the myometrium may be divided into (1) a more or less diffuse metritis which is usually accompanied by an inflammation of the endometrium and (2) gummata. In the former condition the uterus retains its normal shape, it may or may not be enlarged and is usually harder and firmer than normal.

The symptoms vary with the character of the lesion. With the present unsatisfactory status of the pathologic changes produced, the symptomatology is necessarily uncertain. Undoubtedly hemorrhage is the symptom which has attracted the most attention.

The physical signs obtained upon bimanual examination are those usually regarded as characteristic of chronic metritis, namely a slight but uniformly enlarged uterus firm in consistency and tender upon palpation. The specimens removed from these cases show well marked fibrosis and perimetritis.

As in all inflammation involving the endometrium and myometrium, leucorrhoea is a not infrequent symptom. Various types of leucorrhoea have been described. Pain, dyspareunia, and other symptoms common to non-syphilitic metritis have been noted.

The author reports a case occurring in a woman 36 years old who bled so much and whose uterus was so irritable that hysterectomy was necessary. The histologic changes in the uterus were typical of those produced by syphilis elsewhere in the body. The histologic picture was not that of a subinvolution or did it at all resemble those cases which are usually classified as fibrosis of the uterus.

EDWARD L. CORRELL

Jackson, W. R. Gravid Uterus Duplex. *N. Y. M. J.* 9 6 d, 783.

The author reports two cases of gravid uterus duplex as follows. The first case, a female, white, married, aged 9 years, nullipara, complained of severe pains in the abdomen and pelvis. The patient was well nourished and weighed 120 pounds. Menstruation had been regular until four months previous, at which time it ceased. Examination by abdominal palpation revealed a large nodular mass in the hypogastric region. Vaginal touch revealed a boggy mass. After four weeks another examination demonstrated that the swelling had not materially increased. The patient was suffering intense pain and demanded surgical relief. Median laparotomy revealed two large tumors, about four inches in the transverse diameter and six inches in the long diameter. Upon palpation of these two masses, semifluctuation was present and both were of the same dark purple color. Both were removed. The tubes and ovaries were left. The mass on the right side was full of old coagulated blood. The left tumor contained a four months fetus.

The second case was that of a female school-

teacher colored aged 28 years and single. Menstruation had begun at the age of 11 years and continued regular. The patient who was not very well nourished, weight 118 pounds applied for examination and treatment because of severe pains in the lower abdomen and pelvis which were always augmented during menstruation.

Physical examination by abdominal palpation showed tenderness in each iliac fossa, more severe on the right side where a mass the size of a small apple could be felt. No mass on the left side could be palpated. Vaginal digital palpation revealed masses on both sides which were fixed and tender on pressure. The cervix was normal and could be felt in the median line. Speculum examination demonstrated a normal cervix with some mucous discharge.

At operation a two-horn uterus was found each horn being normal in size and having attached to its upper angle a tube and an ovary. The ovary on the right side was one large hemorrhagic cyst the size of an apple that on the left side was normal. Both uteri were in retroversion and united at the cervix into one large neck with the bladder folded in between the cornua and behind the cervix. The appendix was glued behind to the cecum.

The appendix was removed, the two uteri were suspended by their round ligaments (Gilliam) and the cyst was removed. Both uteri were preserved in order to follow the case in the future as to pregnancy.

EDWARD L. CORNELL.

ADNEXAL AND PERUTERINE CONDITIONS

Forsner H.: *Descensus of the Ovary in the Human* (Ueber den Descensus der Keimdrüsen beim Menschen). *Tr. XI. North Surg. Cong. Goeteborg* 1916 July.

In carrying on investigations in regard to the embryology and pathology of the female generative organs the author came in contact with the development of the inguinal canal and thus found occasion to investigate the descensus of the ovary. The mechanics of descensus of the ovary should be explained by a comparative investigation of the inguinal canal of the male and female.

In the male the ligamentum inguinale unites with the ligamentum testis and forms the gubernaculum of Hunter. This becomes stronger and longer until the seventh month. It dilates the canal and reaches even into the abdominal cavity and forms a pillar on the end of which the testicle is attached. The tissue of the gubernaculum becomes more frail and of less resistance. The dilated inguinal canal can therefore be considered a hernial opening. The intra-abdominal part of the gubernaculum which is covered with peritoneum can be considered an inverted hernial sack, on the apex of which the testicle is attached. Later this inverted hernial sack is everted and becomes a positive hernial sack into which the testicle descends. Descensus should be considered as a hernia.

In the female the ligamentum inguinale does not unite with the ligamentum ovarii. The ovary therefore does not come into direct relation with the inguinal canal. The ligamentum inguinale becomes the ligamentum rotundum which undergoes an entirely different development from the gubernaculum. It becomes a firm cord which does not dilate the inguinal canal but seals it. In the female therefore no hernial opening develops and also no hernial sack; the descensus does not occur.

In a case of bilateral retention of the testis the author's investigation showed that the gubernaculi had a histologic structure simulating the relations of the female very closely. They were much narrower and firmer than is usual in the male. No hernial openings were formed and descensus therefore was impossible. The author believes that other forms of retention and ectopia are much easier explained by the hernial theory than by any other.

L. A. JUENKE.

Chaput H.: *The Treatment of Salpingitis by Longitudinal Salpingotomy* (Le traitement des salpingites par la salpingotomie longitudinale). *Bull. et mem. Soc. de chir. Par.* 1916 xlii, 2178.

Chaput has for two years treated the majority of salpingitis which he has operated upon by a conservative abdominal intervention which appears more satisfactory than the previous conservative operations. This operation consists in opening the superior border of the tube in all its length followed by pelvic peritoneal drainage. The procedure comprises tubal incision, ovarian incision, anteifixion of the adnexa and drainage.

The abdomen is opened over the median line from the pubis to the umbilicus, the patient being in the Trendelenburg position. Epiploon adherent to the lower pelvis is stripped and thrown over the skin, the left hand seeks the adnexa which are freed and brought into the wound. Holding the adnexa in the left hand the tube is punctured about its middle, the upper edge of the tube is ripped outward as far as its external orifices and inward to the uterus; the uterine cornua is ripped for a couple of millimeters. The pus is absorbed with sponges and the tubal mucous membrane wiped with dry gauze. No antiseptics are used.

If the arterioles spurt, hemostasis is effected by a few knotted catgut sutures. If the ovary contains abscesses or small cysts a crucial incision is made the summus excised and the cavities wiped with dry gauze.

The adnexa have a natural tendency to fall back into Douglas pouch which favors the formation of adhesions and pelvic abscesses. To avoid this Chaput fixes the adnexa in the vesico-uterine cul-de-sac. He passes a catgut thread into the peritoneum of the anterior face of the uterine isthmus and into the external pedicle of the tube and ties it. The adnexa are then in anteifixion.

Chaput does not use tubular drains for the abdominal-vaginal drainage. He prefers the solid rub-

ber or a filiform drain and he gives the special technique which he employs to effect this difficult drainage, which he terms transligamentaral abdomino-vaginal drainage.

Longitudinal salpingotomy is according to Chaput, indicated for hydrosalpinx for catarrhal salpingitis, for pyosalpinx with thin walls. It is contra-indicated for tuberculous salpingitis and pyosalpinx with thick walls. Chaput has used it in cases of tubal pregnancy.

It may be asked what becomes of the tube thus incised in all its length. The experiments of Cornill and Carnot indicate this. They made long incisions in the bile passage the common duct, ureters, etc. They found that the open organ became covered with epiploon then retracted and reconstituted the normal cavity. Chaput was able to observe the same thing in a reoperated case. In his opinion salpingotomy is superior to colpotomy which is blind and incomplete. It is also superior to salpingectomy because it preserves the ovarian functions and the possible chance of pregnancy. It certainly makes recurrence possible but this is not so great in healthy women. The operation has been performed forty times without a single death.

W. A. BREXMAN

EXTERNAL GENITALIA

Miller A. F. W. Perchloride of Mercury Poisoning by Absorption from the Vagina. *Brit. M. J.* 9 6 II, 453

The patient inserted into the vagina a tablet containing hydrargyric perchloride gr. 8.75 and next morning complained of pain and swelling of the vulva. She showed all the systemic symptoms of mercury poisoning and died in collapse on the sixth day. Autopsy and microscopic examination showed marked involvement of the ileum, caecum, ascending colon and kidneys.

C. J. STAMM

Bleah A. L. A Method for Closing Large Recto-vaginal Fistulae. *T. West. S. & A. St. P. U.* 9 6 Dec.

This operation was devised to fill in a large defect in the rectovaginal septum caused by a slough incident to an attempted perineal repair. The opening was as large as a silver half dollar and was bound firmly in all directions by scar formation.

The technique of the operation was based on the principle of the Whitehead operation. The rectum is dissected free from its surroundings for a considerable distance above the fistulous opening, slid down, cut off and sutured to the anal margin, thus excluding the vagina. This exposed raw rectal surface is then covered with a sliding vaginal flap. The result is primary union with complete cure.

Stein, A. Primary Carcinoma of the Vulva. *Am. J. Obs. N. Y.* 9 6 Jan. 577

The author reports two cases of carcinoma of the vulva which he has operated upon in his practice.

The first recurred and subsequently died. The second was operated upon after the present paper was written. The recurrence in the first case led the author to a careful study of the literature on this subject and to a further consideration of the lymphatic channels which must be considered in these cases. From his consideration of the 270 cases recorded in the literature and the manner of the lymphatic distribution he is impressed with the necessity of a radical interference in these cases, and this is emphasized by the seven illustrations which accompany his article. C. H. D. VII.

LaTorre F. Perineal Lacerations (*Sulle lacerazioni perineali*). *Clin. esat.* 9 6 xviii, 28 30

LaTorre refers to three species of perineal lacerations: (1) more or less extensive lacerations beginning at the vulvar orifice; (2) interstitial tears not involving the external tissues and therefore separations of the muscular masses of the perineum reaching to the raphe, the skin and vagina remaining intact; (3) solutions of continuity occurring in the center of the perineal region. The first category is the most frequent and occurs three times as often in primiparae as in multiparae.

LaTorre, however, prefers what he considers a more rational classification and proposes that perineal lacerations be considered according as they involve (1) the mucosa; (2) the cutaneous layer; (3) the perineal body; (4) the muscular mass only; (5) the center of the perineal region. He discusses lesions under each of these aspects.

Regarding prophylactic care for the avoidance of perineal lacerations LaTorre considers that the whole secret consists precisely in this: to prevent the head from being deflected before it is completely fixed to prevent brusque violent exit to provide that the nape engages well under the symphysis pubis, so that the smallest diameters of the head are in agreement with the vulvar orifice to give the tissues time to slowly distend to artificially deflect the head in contraction intervals and to push back the vulvar margin at a time when the tissues are not injured and yield and when the patient makes no efforts to distend them.

Regarding surgical treatment of lacerations, especially interstitial the older procedure of dividing the rectovaginal septum had the disadvantage that the musculo-aponeurotic perineum was not reconstituted. To remedy this Doleis modified the procedure by causing the detached vaginal walls to slide downward. He calls this procedure colpo-perineal plasticity by sliding.

These two methods were in vogue until the end of 1893 when LaTorre states he took up the matter and became convinced from his investigations on the cadaver that the proper method was to uncover the two musculo-aponeurotic masses which are found on both sides of the median line and draw them together by strong sutures.

In operating after the usual preliminaries, LaTorre introduces a Barnes inflator into the rectal

cavity the points of union of the small and large labia are dissociated a V shaped incision is started with its apex in the center of the posterior vaginal walls terminating at fixed points in the sides. From each of these points another downward incision is made. These two incisions converge and are united at their ends by another incision slightly arched which passes a few millimeters above the anus. There results an incised space somewhat the shape of a bishop's mitre. The cutaneous and vaginal tissue is removed within this leaving at the sides two masses which are the musculo-aponeurotic tissues. These are bared the Barnes bag being removed, and with a gloved finger introduced per rectum to guide the needle, the two masses are sutured together deeply the needle passing through the center of the rectal septum. Superficial suture of the vaginocutaneous wound is then done.

The perineal base is then well reconstituted and the vaginal canal again resumes its normal shape.

LaTorre reports more than one hundred operations done according to his method. This method of colpoperineorrhaphy for interstitial perineal lacerations was for the first time published by LaTorre in 1896. The same process is mentioned in modern textbooks but is not attributed to LaTorre. LaTorre affirms his claims and insists that the operation first performed and described by him should be known as the LaTorre method. W. A. BRENNAN

MISCELLANEOUS

Williams, P. F. and Kolmer J. A.: The Wassermann Reaction in Gynecology. *Am. J. Obst. N.Y.* 1916 lxxiv 638

The authors study is based upon the Wassermann reactions of 300 gynecological patients from the dispensary and hospital wards. They find that the percentage of positive reactions 22.6 corresponds closely with the generally accepted incidence of syphilis in adults. The incidence of syphilis in gynecology on the basis of the Wassermann reaction is so definite that this disease cannot be excluded by a negative history and absence of definite findings.

Of particular interest is the relatively high percentage of positive reactions observed in the following conditions: Stillbirths 75 per cent, rectal diseases 50 per cent, habitual abortion, 50 per cent, pelvic inflammatory disease 36 per cent, sterility 33 per cent, abortion and miscarriage, 29 per cent, metrorrhagia 20 per cent, myomata of the uterus 16 per cent, gonorrhoeal vaginitis 10 per cent, pregnancy 17 per cent.

In this series the authors found that 35.8 per cent of the negro women gave positive reactions as compared with 20.2 per cent of the white women.

Because of the fact that no history of an infection or definite evidence of the disease was obtainable in most cases the authors believe that this high degree of latent syphilis in women should make a routine Wassermann test in gynecological and obstetrical

practice as advisable as any other laboratory procedure. It is certainly as advisable here as in medical and surgical practice. It is of particular importance during the childbearing period. C. H. DAVIS

Smith R. R. Genital Reflexes and Their Role in the Production of Symptoms Arising in the Pelvis. *N. Y. St. J. Med.* 1916 xvi 429

The author divides the pelvic reflexes into (1) those belonging to the spinal and sympathetic system the subcortical reflexes, and (2) those belonging to the higher centers in the cerebrum the psychic reflexes.

The subcortical reflexes lie in the spine, the medulla oblongata, the cerebellum, the corpora quadrigemina, in certain ganglia of the thalamus and the entire sympathetic nervous system. They are sufficient to maintain all the functions of the generative organs. They are subdivided into (1) spinal and (2) sympathetic.

In the spinal group motor mechanism ends in unstriated muscle only. These are the perineal hypogastric and abdominal reflexes. Their function is protective and to assist in labor. The sympathetic subcortical reflexes control the unstriated muscularis of the pelvic organs and the secretion of the glands.

The psychic reflexes include all of those activities in our conscious life in which sensory stimuli are received, acted upon and returned as motor stimuli to the body. But unlike the subcortical reflexes the psychic reflexes after their reception into the centers of exchange do not pass at once into motor stimuli. The degree to which the received stimuli are received and acted upon depends largely upon previous conceptions which combine with the received stimulus. These conceptions result from the sum total of our experience and are dependent upon our emotional makeup, our way of thinking upon hereditary mental endowment and education.

The author discusses the various psychic reflexes and their relation to the subcortical reflexes. The behavior of the psychic reflexes are dependent upon the previous conceptions which join with the sensory impulses in determining the result. It is the abnormal way of thinking of the individual that in the presence of normal or very slightly abnormal stimuli causes disturbance of function.

Certain factors tend to increase the sensitiveness of the individual to emotional disturbances among which are certain drugs as caffeine, strychnine and tobacco the products of the ductless glands, fatigue and pain. But most important is the manner of thinking of the psycho-neurotic individual and the emotional distress to which she is subject. These indirect causes of disturbed function do not act alike in the same individual nor do they have the same effect upon any two individuals but they are important though indirect elements in disturbing pelvic function. The direct cause is the mental makeup of the individual.

S. A. CHALFANT

Watkins, T J : Pelvic Infections in Women; Comments on Some Special Pathology with Application to Treatment. *J Am M Ass* 96 livli, 1916.

The modern treatment of pelvic infections is based on the knowledge that has been acquired in special and general infections and immunity. The rapid advances made in the study of infections and immunity have resulted in radical changes in treatment, especially during the acute period of the disease.

As no specific serums or vaccines have been found for pelvic infections diphtheria and syphilis excluded the treatment, medical and surgical, relative to the acute period is limited to the use of remedies to aid the defensive forces of the body that is to sustain or increase the body resistance. Much of the treatment that has been and that continues to be used reduces body resistance.

The author advocates six to eight hours fresh air daily. The importance of rest sleep food elimination and general hygiene cannot be too much emphasized. They are much more valuable remedies than stimulants tonics alteratives and the like. The patient should be kept in a cheerful mental state.

Blood transfusion which has been employed some what of late must appeal to all as a remedy of great possibilities in the treatment of very acute infections, especially in those in which the patients are unable to develop a good resistance as shown by the presence of leucopenia.

From an experience extending over some years and from logical deductions the author is of the opinion that the treatment of nearly all puerperal cases should be entirely medical that surgical procedures are usually more injurious than helpful. His mortality and morbidity have been much lessened since his treatment has been less surgical and more medical. He has ceased to fear the result in puerperal infections except in the very virulent infections usually virulent streptococci the type with the Hippocratic expression the cases in which the muscles of expression are paralyzed by sepsis the case which is hopeless when first seen. Residues in puerperal infections are uncommon except occasional adhesions. The exudates usually disappear spontaneously by absorption. In practice it is uncommon to encounter much pelvic pathology as a remote result of puerperal infection.

The treatment of non-puerperal infections during the acute period is also chiefly medical. In but very rare instances is surgical interference indicated in these cases. Danger to life is slight in acute non-puerperal infection. The danger is largely one of continued morbidity and recurrent infections.

Curettage of the puerperal uterus is not in accord with the modern knowledge of infection and immunity and has been found by experience to be a dangerous procedure. It is unnecessary as the septic uterus will empty spontaneously.

The author's experience has been that he has

gradually been lessening the number of patients treated by incision and drainage, until it has become the rule, even in cases with large exudates, to use medical treatment until immunity results, and then to do abdominal section if any operative work is needed.

Prolonged operations and ether anesthesia for incision and drainage of pelvic exudates should be condemned as they are unnecessary injure body resistance and delay immunity.

EDWARD L. CORICK.

Charlton F R A Preliminary Note on an Unusual Disease of Pelvic Mucous Membranes. *Srg Gynec & Obst* 96 xxiii, 37.

There is a form of cystitis in old women hitherto inadequately described that is believed to be a distinct clinical entity. It is very common. It appears soon or late after the menopause, being somewhat variable and essentially chronic in its course. The cystoscopic picture varies but commonly presents during exacerbation, a bulboedema a patchy vascular rash which the author (he rarely speaks of as a menle. This is transient and disappears with the subsidence of the acute attack leaving a smooth but apparently pigmented and ecchymotic appearance in the interval. The question of infection is undetermined and the histopathology has not been studied. It is believed to be almost wholly a senile change due to atrophy of underlying connective tissues atrophic changes that may lead to ulcerations with accompanying mixed infection. Vigorous curative efforts are not approved of since the condition is hardly amenable to eradication. Milder measures of treatment such as irrigations and instillations are advised, with pure liquid guaiacol internally. This drug is almost specific in its action given in doses of five to ten drops after meals.

Armstrong H M Pelvic Inflammation. *N Y M J* 96 ci 730.

Armstrong accepts Adams's definition of inflammation the series of local changes which constitute the reaction to injury or irritation of a part. The tria are the vagina, cervix uterine surface, tubes and peritoneum.

Infection through lacerations of the vagina due to labor are rarely transmitted as there is a prophylactic infiltration and edema preceding parturition. The cervix admits infection readily as it is richly supplied with lymphatics. Streptococci pass into the cellular tissues of the broad ligament and also into the circulation. The patient with this type of infection, succumbs to infection of the cellular tissue and of the subperitoneal tissue behind and in front of the peritoneum. On the other hand, ataphylococci have a different pathology—localized collections of pus in the broad ligament and cellular tissue of the peritoneum. Early drainage is indicated in these cases via the vagina. Thrombophlebitis may occur with the enormously dilated

veins present in gestation. Thrombophlebitis of the veins of the placental site had a mortality of 85 per cent.

For the saprophytic form of endometritis, Armistead advises gentle curettage but for a septicemia, there should be no curettage merely Fowler's position and salt solution administered per rectum. If there is localization drainage per vagina should be instituted.

In addition to the neisserian infection there is also tubercular pneumococcal and colon bacillus. The latter is often due to vaginitis of infancy. This vaginitis is often relieved by a solution of lactic acid bacilli.

W. F. HENRICH

Koehler R. Animal Charcoal in Septic Diseases (Tierkohle bei septischen Erkrankungen) *Zentralblatt f. Gynaek.* 1916 No. 39.

The author in conjunction with Pollak as early as 1913 commenced testing the eminent absorptive properties of Merck's animal charcoal in septic gynecological diseases and in a series of puerperal peritonitis cases as well as in cases where the peritoneum had been soiled with infectious matter. In the first few cases the charcoal was spread out dry which has the advantage of keeping the absorptive properties almost intact, but owing to the moisture and the retained pus in the abdomen the charcoal became moist and a thorough spreading of the powder into all folds and pockets never occurred. The charcoal was therefore applied in a solution 100 to 200 gr. of the charcoal in 1 to 2 parts of normal salt solution. This was applied through a hose into all pockets of the peritoneal cavity successfully as shown by later autopsies.

The small number of cases (10) is no criterion of the value of the substance. Five cases of suppurative peritonitis were treated with this method. Of these 2 were cured and 3 died. One case of diffuse peritonitis as a result of suppurative hematocoele following tubal pregnancy was cured. Prophylactically the charcoal was applied 4 times (3 cases of suppurative adnexitis and one case of pyometra) 2 were cured and 2 died.

The results in these cases of course are not less than with other forms of treatment but it is extremely difficult to say that in septic peritonitis any method of drug is the deciding factor. A large series however may mean something.

In a case of pyometra however, in which the substance was applied prophylactically and which later came to autopsy on account of pulmonary disease the action could be studied carefully. *Intra vitam* the patient ran the course of a diffuse peritonitis of ordinary severity and gradually recovered. At the autopsy no evidence of the peritonitis was present. The peritoneum however was slate gray in color throughout its entire extent. The lymphatics were filled with the charcoal and stood out clearly. The lymph glands were enlarged and black in color through inhibition of the charcoal particles.

Perhaps in addition to the purely absorptive action of the animal charcoal there also is the mechanical action the closing up of the lymphatics delaying and probably hindering entirely the absorption of toxic material. It is therefore possible that in a but slightly damaged organism with a still fairly good functioning heart the organism is given time to form antibodies which is impossible in the sudden overwhelming with toxins where the lymphatics are wide open.

Further tests with the intravenous application of the substance were to have been conducted but had to be postponed until a more favorable time on account of the war.

L. A. JUNKER

Hartmann, S. P.: Experimental Investigations in Regard to Entrance of Infection and Mode of Spreading in Tuberculosis of the Female Generative Organs (Experimentelle Untersuchungen ueber die Eingangspforten und die Ausbreitung der Tuberkulose der weiblichen Geschlechtsorgane) *Tr. XI North S. S. Cong. Goeteborg* 1916 July.

On the basis of experiments on guinea pigs the author comes to the following conclusions:

1 The development of a genital tuberculosis as a result of spontaneous migration of the tubercle bacillus through the vagina is very doubtful. The animal experiments which have been carried out to support this theory of ascending infection are all questionable as to accuracy.

2 Animal experiments submitted as proof of ascending migration of the bacilli against the stream of secretion are positively misinterpreted. In such cases there are always signs pointing to the interference of the flow of the secretion although the infection may have even traveled upward through the lymphatics.

3 The possibility that primary tuberculosis may result from cohabitation cannot be disproved but most cases will not stand a critical investigation.

L. A. JUNKER.

Reynolds, E.: Fertility and Sterility. A Histologic Study of the Spermatozoa, the Ovaries, and the Uterine and Vaginal Secretions in Their Relation to This Question. *J. Am. M. Ass.* 1916 April 1193.

To estimate the fertility of a given male we must judge not only of the numerical frequency of the spermatozoa and of the percentage of motility present, but must further study carefully their vitality both as it is determined by duration observations and still more importantly by the quality of the motility present.

All the normal motions appear to be consecutive phases. Initial motion i.e. motion as seen in fresh semen under favorable conditions, consists of a lashing of the after part of the tail from side to side which is so rapid as to constitute vibration. It produces rapid forward motion in a practically straight line the head middle piece and forward

portion of the tail maintaining their position in the line of motion with practically no swaying from side to side. The action of the flagellum is so rapid that it is quite impossible to follow its individual movements. Spermatozoa swimming in this manner always head against a current and usually cross the field of observation in about five seconds in the absence of currents or obstacles.

The second normal motion differs from the first not only in its character but in markedly reduced speed. The tail movement alters to a long slow stroke from side to side and almost the whole length of the tail partakes in the stroke. This is, moreover, accompanied by swaying of the head and middle piece through an arc which is always considerable and may even equal 90 degrees. The general outline of the spermatozoon, from being practically straight with almost non-detectable sharp quick small arc vibration of the aftertail has become an S in outline with large, slow plainly perceptible undulations traveling gradually backward through out the length of the spermatozoon. Speed has been lost and direction seems to be more specifically determined by the surroundings. Individuals at this stage show a pronounced choice of direction and go up to objects in the medium, from which they later make off as though the movement were determined by tactile reaction to some extent.

The third type of normal motion succeeds the second and consists in a tendency on the part of the spermatozoon to push itself against or into any small masses of cells, or sometimes other materials, which it may find in the neighborhood bunting itself into any small crevice that can be found and maintaining a slight burrowing motion by a lashing tail movement of the vibratile type not unlike the movements of the caudal fin of a fish. The movement of the flagellum in this third type is unlike the second type in that it is vibratile rather than lashing but is slower than the vibratile motion of the first type and less limited to the after part of the tail. The three types of normal motion are not only distinct but are always consecutive.

In specimens which have later proved to show poor vitality there has usually been, on the other hand a somewhat low percentage of motility at the start, i.e. the number of motionless specimens has been large.

The flora of the virgins and fertile women so far studied have been coccoïd and have usually consisted mainly of one form of coccus homogeneous. One fourth of the sterile women had a coccoïd flora but these were all cases of short standing and of apparently promising outlook. The other three-fourths of the sterile cases had bacillary flora usually containing one dominant form of bacilli (homogeneous).

The bacilli in these sterile cases were ordinarily rather low in occurrence and somewhat distinctive in appearance. Moreover they represented a very characteristic distribution of attachment or superposition on the vaginal epithelial cells which is less marked among the other bacillary flora.

All the pregnant and puerperal women had bacillary flora, but these showed always the presence of several forms in approximately equal numbers.

The general similarity between the flora of established sterility on the one hand and those of pregnancy and the puerperal state on the other seems interesting in view of the probable non-ovulating condition of the ovaries during pregnancy and the puerperal state and in a large proportion of all sterile cases.

Vaginal hostility to the spermatozoa is mainly enzymatic and of bacterial origin. Cervical hostility is mainly mechanical and of inflammatory origin.

Either or both of these secretions may and frequently do present conditions which absolutely prevent fertility through their destruction of the spermatozoa and which are yet so far external to the physiology of the woman as to cause no ill health, to produce no symptoms other than persistent sterility. The microscopic study of the secretions is of much practical value. EDWARD L. CORNELL.

Gary W. H. *Examination of Semen with Special Reference to Its Gynecological Aspects.* Am. J. Obs. & G. 6 July 1913.

The author gives a careful discussion of this subject with a rather complete review of the literature. The various methods of collecting and examining the semen are described. The types of semen found in different individuals are shown in ten illustrations. From his study of this subject the author offers the following suggestions:

1. In the study of sterile marriages, to conduct exhaustive gynecological treatment and ultimately to offer a hopeless prognosis without investigating the reproductive powers of the husband is neither fair nor scientific.

Semen examination, by reason of its intimate character and its vital relation which it bears to the general subject of sterility is best performed by the gynecologist.

3. Selection of the method of collection and transportation to the office of the examiner must be made to suit the individual conditions, with special regard to maintaining the warmth of the specimen and arrangements for immediate examination.

4. Examination is best made with the high-power lens. In addition to noting the general physical properties, the determination of efficiency depends on the degree of oligospermia, the percentage of imperfect spermatozoa—whether immature or deformed, the percentage of the cells that are motile—whether sluggish or lively and finally the length of time activity persists.

Recent experiments have shown that a specimen obtained directly from the male, which appears to be poor may reveal an exaggerated activity when obtained from the vagina where it has been mixed with the secretions incident to normal coitus. Such experience suggests that before an unfavorable prognosis can be made complete study must include a

Inquiry into the physiological affinity of the male and female secretions

Observations show a direct relation between the vigor of the individual and the potency of the semen.

Treatment is usually a genito-urinary problem. A large proportion of cases are improved by measures which improve the general health and sexual hygiene. Twenty five per cent efficiency warrants artificial impregnation fifty per cent justifies correction of definite female pathology C H DAVIS

Crossen H S : Gynecologic Surgery in Hyatersonaesthetic Patients. *N Y St J Med* 1916 xvi, 427

The author states his own convictions and cites his practice as answers to three questions.

1 Is operation indicated? Where the pelvic lesion is definite and is seriously depressing the general health operation should be performed irrespective of the coexisting nervous disease.

There are two other classes in which the connection between the symptoms and the pelvic lesion is not so clear

a Those in whom the principal symptom is pelvic pain without sufficient pelvic pathology to account for it In these the result is never an ordinary one but is either very poor or very good. It is well to begin with the least severe measures and advance to the more radical ones. Each case must

be thoroughly studied from all viewpoints to determine the true cause of the symptoms

b Those in whom the symptoms are extrapelvic supposed to be due, in whole or in part to some intrapelvic lesion. In these the removal of the pelvic lesion will relieve the general nervous disturbance only in so far as that nervous disturbance is due to malnutrition or to general irritation of the nervous system dependent on the local lesion

2 If indicated, what is the preferable time for operation, before or after the course of neurologic treatment? When operation is inevitable it should be done first and the neurologic treatment started during convalescence. If the influence of the pelvic lesion as a cause of symptoms is doubtful the neurologic treatment should come first as it may entirely relieve the symptoms. The operation is to be considered only after the neurologic treatment thoroughly tried out by a competent neurologist has failed

3 When operating should more conservatism or less conservatism be practiced than in an individual with a normal nervous system? These patients are not good subjects for conservative surgery but, on the other hand they are equally unfavorable for radical work particularly the removal of both ovaries. The rule should be Radicalism until the last ovary is reached and then great conservatism. S A. CHALFANT

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Enge, L. A. Acidosis in Normal Uterine Pregnancy. *Am J Obst N Y* 96:lxiv 769.

The author offers this preliminary report only to establish the fact that some degree of acidosis is nearly uniformly present in uterine pregnancies. The technique reported by Van Slyke in '05 and his tables were used in this study. The results are presented in four tables.

Of the 61 cases 55 show readings below 50 volume per cent which is approximately the lowest reading noted in any of the non-pregnant cases. Fifty nine of the cases fall below the volume per cent of 53 which Van Slyke takes as the lower limit of normal. An acidosis of varying degree, therefore, was found in nearly all cases. C H Davis.

Wright, O R. Puerperal Eclampsia. *J Lancet*, 94, xxxvi, 567.

Wright reports 6 cases of eclampsia in one year following a period of 20 years in which he had 100 obstetrical cases without a single case of eclampsia. A summary of cases follows — 4 were hospital cases and in all cases ample assistance was at hand.

| Case | Anamnesis | Operation | Result | | Remarks |
|------|-----------------------------|---|--------|------------------------------|---------------------------|
| | | | Mother | Child | |
| 1 | 3 mos. | Maximal distention, varicosities, hemorrhage | Well | Well | Considerable labor |
| 2 | mos. | Maximal distention, vaginal, cesarean section | Well | Lived 10 hrs | Unable to deliver |
| 3 | 7 | Maximal distention, varicosities | Well | Twins, lived | Flat pelvis |
| 4 | weeks | Not given | Well | Well | |
| 5 | Disappeared under treatment | Fetoscope | Well | The birth only about 10 min. | Mother stayed in bed |
| 6 | Absent | None | Dead | Dead | Died after one convulsion |

The after treatment was water by rectum for three days, venatrum, and elimination. The dead child was only a 7 months' child. W F Hitt.

Davis, E. P.: Delivery by Abdominal Section. *Surg Gynec. & Obst.* 910:xxlii, 46.

Davis presents for consideration the fact that sharing in the growth of abdominal surgery cases of pregnancy complicated by pathological conditions may demand delivery by section.

Experience has shown that it is often difficult to make an exact diagnosis of intra-abdominal conditions although it may be evident that pathological lesions of importance may be present. Highly contracted pelvis is now one of the simplest complications of pregnancy because it is evident and its treatment clearly indicated.

Rupture of the uterus demands section usually completed by hysterectomy.

Foci of infection in pelvic or abdominal organs developing during pregnancy demand section so soon as a diagnosis can be established. This is especially true of appendicitis which seriously complicates pregnancy parturition, and the periperal state.

Abdominal and pelvic tumors complicating pregnancy frequently demand section. Small subserous fibroids may be let alone, but other tumors should be removed.

At present the treatment of pregnancy complicated by hemorrhage from the placental site, whether the placenta be normally situated or previa, is the topic exciting most interest among obstetricians. Separation of the normally implanted placenta is most safely dealt with by vaginal or abdominal section. A considerable number of placenta previas do best by abdominal section.

Improvements in anesthesia and improved methods of avoiding shock offer advantages for elective section without labor in patients ill fitted to pass successfully through parturition.

Remembering that delivery by section is the safest artificial method for the child cases arise where the small risk of elective section may be willingly accepted for the sake of the child. So where the mother is moribund section may be performed with the hope of rescuing the child.

The question of sterilization must be decided upon the merits of each case. With the history of unusually painful and difficult labor husband and wife may rightly choose to avoid further pregnancy.

Ectopic pregnancy like many cases of placenta previa, is treated safely by section only.

No genuine advance in obstetric surgery can be made unless men are trained for this branch of work, and obstetrics is recognized as largely a surgical specialty. The development of American surgery has made practically impossible the career of a general surgeon. Surgery is now a group of specialties, and not the least important among these is the work of the obstetrician. A critical comparison between the results of the use of forceps and other ordinary methods of delivery in the hands of the general practitioner and the results obtained by competent obstetricians show the superiority of the

latter. Complicated parturition demands hospital care and special skill quite as much as appendicitis, abdominal and pelvic tumors and other conditions which are acknowledged to require surgical aid.

The author summarizes his experience in 129 classic cesarean sections, 50 hysterectomies in which the stump was dropped, 32 Porro operations in which the stump was fastened in the lower end of the abdominal incision, 3 extirpations of the uterus and 2 sections performed at the moment of maternal death, a total of 216 operations. Of these cases 151 were apparently uninfected and in good condition at the time of operation. Among these there was one maternal death, a percentage of 0.66 from peritonitis caused by the bacillus proteus vulgaris whose origin could not be found. There were 60 cases infected when brought to the hospital or suffering very serious lesions of the heart, kidneys or liver. Among these there were 16 deaths, a mortality of 26 per cent.

The maternal mortality of the entire 216 cases was 8 per cent. The fetal mortality resulted from injuries or diseases before the mother was admitted to the hospital. Among those fatally infected it is interesting to note that pulmonary infections were the most dangerous. Puerperal septic infection could usually be successfully treated by the Porro operation.

McPherson, R.: Is the Operation of Cesarean Section Indicated in the Delivery of Breech Presentation? *Am J Obst N Y* 1916 lxxv 776

This paper is based on the author's analysis of 3,412 cases of breech presentation and delivery which have occurred in 97,000 confinements in the New York Lying In Hospital, thus including all cases to September 1915. He has endeavored to include in the fetal mortality only those cases in which the cause of the stillbirth could be directly attributed to the breech delivery.

He finds that so far as the prognosis for the mother is concerned the maternal mortality does not and should not differ greatly from that of vertex presentations in uncomplicated cases. The maternal mortality in his series including cases complicated by convulsive toxemia of which there were 3, placenta previa of which there were 63, chronic nephritis, chronic endocarditis, pneumonia, etc., all of which have a mortality of their own was 0.96 per cent. Excluding these complications the maternal mortality was 0.47 per cent. Many of the cases had been handled by outside physicians and midwives.

The fetal mortality has been estimated by various writers at from 10 to 30 per cent. In these 3,412 cases of breech presentation 336 children at term were stillborn, a mortality of 9.4 per cent, 442 were premature and probably would not have survived in any event.

Regarding the parity of the mothers 944 were primiparae, 2,468 were multiparae.

Regarding the fetus there were 198 stillbirths among the 944 primiparae and 560 stillbirths among the 2,468 multiparae, a percentage of 21.6 per cent and 22.7 per cent respectively.

The author does not believe that a breech presentation is *per se* a just indication for a cesarean section. C. H. DAVIS

Essen Moeller, E.: Ileus During Pregnancy and Parturition (Ueber Ileus in der Schwangerschaft und bei der Entbindung). *Tr. VI. Norsk Surg Cong.* Goeteborg 1916 July

The author discusses the etiology and treatment of ileus during pregnancy and labor and reports six personal cases. Regarding the etiology he believes that while pregnancy alone in certain cases can produce a mechanical ileus in most cases it alone is not sufficient to produce a complete occlusion of the bowel. In the patients with ileus during pregnancy there frequently is obtainable a history of previous abdominal trouble. Attention is called to the fact that frequently ileus is not diagnosed during pregnancy until too late, probably due to the fact that the abdominal pain is considered labor pain or it is confused with some other acute abdominal disease such as appendicitis, cholecystitis, etc.

In regard to treatment the author cites Wilms' *notet qus caspical*. The interference with bowel passage must be attacked operatively and as early as possible before intoxication symptoms develop. The question whether the uterus should be left alone during the operation or should be emptied is much more difficult to answer. In reviewing the literature it was found that not less than two-thirds to three-fourths of the cases had a miscarriage or premature labor so closely following the operation that it must be concluded that they were undoubtedly due to the operation or the disease.

Since the life of the pregnancy is considerably endangered by the disease, the author believes there is justification in certain cases in emptying the uterus before attacking the disease, thus lessening the difficulties of the abdominal operation. The author favors vaginal cesarean section as a means of emptying the uterus although admitting that the abdominal section in certain cases has its advantages; he believes it can be determined beforehand whether such a section will really be necessary.

The author's paper led to quite an active discussion. Further cases of ileus during pregnancy were reported by Groene, Hellstrom, Bovin, Hedlund and Ekeborn. Groene advises and prefers the use of the abdominal section for emptying the uterus, Hellstrom and Bovin depend on conditions found upon vaginal section for emptying the uterus in cases where definite signs of peritoneal inflammation are present, otherwise laparotomy and the ileus operation and when necessary emptying of the uterus by means of the classical cesarean section through the same abdominal wound and finally even supra vaginal amputation if drainage for advanced peritonitis is necessary. L. A. JENNIE

Lindquist, L. Tuberculosis of the Kidney During Pregnancy (Ueber Nierentuberkulose in der Schwangerschaft) *T XI North Surg Co s* Goeteborg 9 6 July

The author reports a case of tuberculosis of the kidney which developed during the first few months of pregnancy. Nephrectomy performed during the third month was followed by recovery. A few months later symptoms again developed pointing to the urinary passages. After delivery the general condition of the patient grew worse and death resulted about one year after the operation, probably due to tuberculosis of the second kidney. He reports a second case of kidney tuberculosis probably of longer standing, which became aggravated a few months after the third delivery. Nephrectomy two months later resulted in uneventful recovery. The patient is still well three years after the operation.

The author is of the opinion that in one-sided tuberculosis of the kidney nephrectomy should be performed as early as possible, even in pregnancy. The danger of the remaining kidney not being able to meet the requirements of pregnancy is slight if it is sound and able to bring forth the ordinary compensatory hypertrophy. After the nephrectomy the patient must be watched carefully so that in case a latent tuberculosis of the remaining kidney becomes active an interruption of the pregnancy may be done immediately. Tuberculosis of the bladder is an indication for the interruption of pregnancy only if after nephrectomy it shows no tendency to improve or if it becomes aggravated. In bilateral tuberculosis of the kidney pregnancy should be interrupted irrespective of the duration of the pregnancy, except in cases where a prolongation of a few weeks will make the child viable.

EXHORN is of the opinion that a pregnancy should not hinder a nephrectomy in tuberculosis of the kidney. The nephrectomy causes an improvement in the condition of the other kidney. It is well known that one kidney always suffers from the disease of the other organ, and in a simultaneous pregnancy it suffers all the more.

JOSEPHSON stated that while it is recognized universally that pregnancy takes a normal course after a nephrectomy if the remaining kidney is only sound, it is advisable that a period of time, say two years, intervene between a nephrectomy and a pregnancy so that the remaining kidney can accommodate itself to the increased work thrown upon it. In his opinion, the older view that pregnancy should be avoided after nephrectomy or after an interruption of pregnancy is entirely erroneous. L. A. JOHNSON.

LABOR AND ITS COMPLICATIONS

Meyer, L. Elderly Primipara (Aeltere Erstgebäuerin) *T XI North Surg Co s* Goeteborg, 19 6 July

The author criticizes the explanation that the frequent abnormalities occurring in the delivery of

elderly primiparae are due to the rigidity of the parturient canal. This rigidity has not been demonstrated pathologically. It is, if it is to be considered a senile change, *a priori* not probable at so early an age as 30 to 40 years. Furthermore there are no difficulties found in many elderly primiparae.

The author considers the matter in the following light. Two classes of elderly primiparae should be considered: (1) women who only later in life have married and become pregnant or who previously practiced abstinence or preventive measures, and (2) women who in spite of early marriage and desire to become pregnant do not become pregnant until the later years. It is cases of the latter class of primiparae, according to the author that present the abnormalities in delivery which are ascribed to the general class of elderly primiparae. The author believes that the conditions that delayed conception are the conditions responsible for the abnormalities at delivery. He suggests this only as a hypothesis and as it is self-evident is unable to furnish the proof for his views. It is his purpose to stimulate interest in the subject so that the cases of elderly primiparae will be observed more closely.

L. A. JOHNSON.

Costa, R. Lumbar Puncture of the Foetus During Podalic Extraction in the Interest of the Life of the Foetus Itself (Puntura lombare del feto durante l'estrazione podalica nell'interesse della vita del feto stesso) *West d esp d clin.*, Milano 9 6 xviii op

Costa states that it is known that owing to the compression of the fetal head during labor a part of the cephalorachidian fluid passes from the cranial to the vertebral cavities, which allows a certain degree of reduction of the size of the head. It occurred to him, therefore, that on account of this reducing influence of the withdrawal of the fluid it would be useful in certain cases of podalic extraction, in which the descent of the head presented special difficulty to practice lumbar puncture on the foetus during the delivery.

The author's experience with this procedure has been limited, but added to theoretic deductions it leads him to believe that such lumbar puncture of the foetus would be of value in the preservation of fetal life in difficult cases. Its utility is due to the fact that the withdrawal of part of the cephalorachidian fluid gives an easy and marked reduction in the cranial diameters: there is less compression of all the central nervous system particularly of that center which regulates the heart rhythm, and the respiration at birth, thus obviating asphyxial manifestations or lessening their gravity. The operative act is easy and rapid.

As soon as the breech appears externally it is curved somewhat in order to raise up the spine and a needle of medium size is introduced between the spinous apophyses of the fourth and fifth lumbar vertebrae: no fluid is withdrawn immediately but it escapes spontaneously when the fetal head is compressed in the birth canal.

The practice, in the author's opinion can be extended to any case where there is difficulty in extracting the head on account of insufficient dilatation or dilatibility on account of vicious pelvis when it is a question of podalic extraction. Future experience alone will show whether this can be substituted for methods now followed in cases of pelvic stenosis.

W. A. BRENNAN

Boero E. A.: Pregnancy at Term in a Bicornate Biccervical Uterus (Pseudodidelphic) (Embarazo a termino en un utero bicorne bicervical-pseudodidelpho) *Prensa med. Argent.* 1916 III 83.

The clinical history of the woman whose case is reported by Boero was not marked by any particular antecedents. The vagina was divided in its superior portion and terminated in two uterine orifices. In the cornua of the left side there was a fetus at term. Intervention was called for owing to delay in labor due to weak contractions. The cervix was dilated and the forceps applied extracting a female child weighing 3,300 grams. Later palpation proved the uterus was bicornate and bicervical.

W. A. BRENNAN

Haultain F. W. N. and Swift, B. H.: The Morphine-Hyoscine Method of Painless Child Birth or So-called Twilight Sleep *Brit. M. J.* 1916 II, 513

The following is a summary of special points which are brought out by the author

1 In the case of a primipara the first injection must not be given too early as it tends to stop the pains. The rule of giving the first injection when the os admits two fingers and the pains are regular is a useful one. In the case of a multipara, however the injections cannot be given too early after the pains have started. It is generally found that the first injection is given too late.

2 The second injection, namely the first 1/450 gr. of pure hyoscine should be given about an hour after the initial injection, whether the patient is well under or not. If this injection is delayed the effect of the morphine tends to wear off when the future injections of hyoscine will not take effect.

3 The injection can be repeated with safety either at hourly or three-quarter hourly intervals.

4 The morphine should not be repeated in the latter part of the second stage or the child will most probably be born oligopneustic. If the hyoscine is not taking effect then it is well to give the mother a slight whiff of chloroform thus the hyoscine is allowed to work and the patient again gets into the condition of twilight sleep.

5 The patient's friends must be kept away from the room which should be quiet and darkened.

6 Patients, if thirsty must be given water to drink.

7 The bladder must be catheterized during long labors.

8. Remove the baby to another room after birth so that the mother cannot hear the cries otherwise

she may remember the cry and so imagine her whole labor.

Total amnesia and analgesia were obtained in 30 out of 40 cases namely 75 per cent.

There was only one case of postpartum hemorrhage and it was easily checked by hot douching and pituitrin.

There were 14 forceps cases in the 40 cases or 35 per cent.

Five babies in the series were born dead but in only one of these was the labor normal. One was a case of contracted pelvis with prolapse of the cord. The child was turned and extracted with difficulty. The patient only had four injections and then chloroform. She had come into the hospital well on in labor with a previous history of a stiff forceps case. The second stillborn baby was a very badly nourished premature child of a woman who had a very bad heart lesion. The third was a craniotomy for contracted pelvis, where the second stage was allowed to continue for nine hours to permit of molding. The fourth was a premature child of seven months. The fifth was a normal labor, which lasted twelve hours during which eleven injections were given. Of the 35 babies born alive only 4 required any artificial stimulation.

From the foregoing experience it may be concluded that we have a safe and efficient means of managing labor painlessly in the majority of cases. It requires however the constant attendance of a competent attendant. This rôle can be efficiently undertaken by a reliable nurse under supervision which makes its adoption in better class private practice possible to the medical practitioner.

It is of special value in primiparae, in whom, as a rule the first and second stages of labor are long and painful.

It is also of great value in a prolonged second stage, due to a large head or slightly contracted pelvis as it allows of head molding without unduly exhausting the patient.

So far as amnesia is concerned it is of little use to commence the treatment during the second stage.

The strength of the uterine contractions is not diminished, hence its advantage over chloroform. There are no contra-indications to its use beyond extreme restlessness which is very exceptional and probably due to an idiosyncrasy.

The absence of exhaustion after even a long labor is one of its greatest advantages.

Of the 40 patients 37 rose from bed on the third day after labor.

EDWARD L. CORNELL

Heard A. G.: Does Administration of Pituitrin to the Mother Produce Diffuse Nervous Lesions in the Infant? *Texas St. J. Med.* 1916 XII, 264

The author reports three cases of extensive cerebral or meningeal hemorrhage of the newborn undoubtedly due to birth injury. In no case was the child a firstborn in no case was there any constitutional disease on the part of the parents which could have been construed as an etiological factor.

in no case was there any question of prolonged or difficult labor in every case a precipitate delivery was effected by the administration of pituitrin early in labor with consequent induction of violent uterine contractions.

From his observations and a study of the literature the author comes to the following conclusions: The improper use of pituitary extract in labor is a cause of cerebral or meningeal hemorrhage in the newborn. Hemorrhages in the nervous system of the infant resulting from the use of pituitrin in labor are productive of diffuse nervous lesions so extensive as to result in early death, or if the child survives, in the terrible afflictions of paralysis, epilepsy and idiocy. Cases presenting nervous lesions resulting from birth injuries should be carefully investigated as to the possibility of pituitrin having been a factor in their causation.

C. D. HATCH

PUERPERIUM AND ITS COMPLICATIONS

Stein, A. Puerperal Gangrene of the Extremities. *Surg. Gynec. & Obst.* 9 6 XXII, 424

In this extensive article which is based upon two personal observations and a careful comparative review of the literature attention is called to this dangerous complication of the puerperium and to the necessity for its early recognition. As many gynecologists have never seen a case of this kind but may at any moment find themselves confronted with this precarious situation the study of the case reports is sure to prove both profitable and interesting.

A review of the large clinical material which has been compiled from the world's literature is greatly facilitated by the arrangement of the 76 cases under the different headings of puerperal gangrene of the lower and upper extremities respectively—63 cases gangrene after abortion—4 cases gangrene during pregnancy—4 cases and gangrene following gynecological operations—5 cases the latter having been included for completeness sake. These statistics will further assist orientation in the collected material.

The etiology of peripheral puerperal gangrene with special reference to infections is thoroughly discussed as well as the arterial, venous, and arterio-venous origin of the cases, and the clinical picture is graphically outlined.

In commenting upon Raynaud's disease the author points out that this was first observed in a puerperal woman. The forensic importance of puerperal gangrene is emphasized and as forewarned is forewarned the large collection of cases from the literature will serve as a helpful precedent.

One of the author's cases was a primipara of 19 years with typical, symmetrical, dry gangrene of both feet and lower legs after labor term, death occurring some weeks later due to exhaustion. His other observation on a young woman of 20 years adds the fourth case to the very small number of

recorded cases of peripheral gangrene following abortion. It is also of interest on account of the favorable outcome for after the leg had been amputated below the knee the patient was discharged in good condition.

In supplementing his own observations with the instructive material which is so widely scattered in the general literature the author hopes to have offered a serviceable contribution to surgical gynecology.

MISCELLANEOUS

Davis, E. P. Obstetric Surgery a Modern Science: Its Scope and Limitations. *J. Am. M. Ass.* 9 6 1

Last to share in the general advance in modern medical science has been obstetrics. While there remain unsolved problems in the pathology of pregnancy and parturition a considerable gain has been made in reducing the mortality and morbidity of parturition from hemorrhage, septic infection and shock and in securing a sound anatomic recovery for the mother and thus with a lessened risk for the child. The application of the principles of surgery to obstetrics has made this possible.

There still remains a relic of bad practice in the fact that the attempt is sometimes made to deliver the unengaged head by forceps. It is difficult to eradicate from the mind of the general profession the belief that one need not wait for engagement and molding for the successful application of forceps but until this is abandoned there will remain from this source a considerable maternal and fetal mortality and morbidity.

For the mother modern obstetric surgery aims to obviate the dangers of contracted pelvis and disproportion between mother and child to deal successfully with foci of infection or pathologic conditions of the pelvis or abdomen complicating labor to repair the lacerations in the genital tract produced by labor and thus to restore the mother to sound anatomic condition after parturition. While these results are certainly important modern obstetric surgery does far more in the interest of the child. Delivery by abdominal section is the safest artificial method of delivery.

Do the results of modern obstetric surgery as compared with the results obtained by spontaneous labor justify its existence or have we lost the art of obstetrics and substituted for it a surgical monstrosity?

The maternal mortality of labor is difficult to estimate outside of institutions. It is fair to state, however that the maternal mortality of spontaneous labor is a fraction of per cent under ordinarily favorable conditions. The mortality of spontaneous labor for the child is the mortality of asphyxia and while it is difficult to obtain exact statistics concerning this, it is not a negligible factor in considering the results of spontaneous labor.

If we place in direct contrast with this the results

obtained by the classic cesarean section when mother and child are in good condition, it is not unusual to find a series of cases ranging from 40 to 60 without a maternal death. If larger series of cases are taken, a mortality of from 2 to 3 per cent is given. In the author's experience in 151 cases of patients not septic and not toxic the maternal mortality was 0.066 per cent.

High maternal morbidity following the use of forceps is given by Gans from the Koenigsburg clinic as 21 per cent and of these 3.82 per cent were cases of severe septic infection. In estimating the frequency of lacerations in forceps cases episiotomy was required in 24.73 per cent and of these patients 51.06 per cent sustained lacerations during delivery. The perineum was lacerated in 16.9 per cent.

The fetal mortality following the use of forceps varies in proportion to the mode of application. In the so-called low forceps operations the fetal mortality of the Sloan Maternity Hospital was approximately 10 per cent in medium operations 19.2 per cent and in high operations 38.5 per cent, an average of 14.5 per cent. In the Koenigsburg clinic the fetal mortality attending the use of forceps was 12.45 per cent. In this clinic the high application of forceps had a mortality of 33.33 per cent for the children.

The indiscriminate application of cesarean section as a last resort is not modern obstetric surgery but is the old and familiar error which for so long a time prevented the development of modern obstetric science. Modern obstetric surgery should be limited carefully by a thorough knowledge of the natural phenomena of labor by the practice of palpation and auscultation in all cases and, above all, constant observation in diagnosing the engagement of the presenting part. No more common or dangerous error is made in studying labor than to mistake the unnatural position of the head of excessive lateral obliquity for a normal engagement.

The most important and essential limitation in modern obstetric surgery is the choice of those persons who shall practice it. Modern obstetric surgery can best be done by obstetricians and not by general surgeons or by gynecologists. The technical performance of delivery by abdominal section is in many cases comparatively simple, and the general surgeon and gynecologist are inclined to vary the monotony of their practice by short excursions into the field of obstetrics but they lack the practical experience which is the basis of all sound judgment in deciding when to perform an obstetric operation and in choosing the best method.

EDWARD L. CORNWELL.

Groene O Does Superfoetation Occur in the Human (Kommt eine Ueberfruchtung beim Menschen vor)? *T. XI North. Surg. Cong. Goeteborg* 1916 July

The author comes to the following conclusions:
1. The possibility of superfoetation in the human cannot be denied on theoretical grounds.

2. Until now no case has been reported proving the occurrence of such a case.

It is impossible to construe a theoretical case that could prove the occurrence of superfoetation in the human.

L. A. JUNKE.

De Lee, J. B. Meddlesome Midwifery in Renais-
sance. *J. Am. M. Ass.* 1916 April, 1126

Of great importance is the continued excessively high morbidity of both mothers and babies as the result of labor. One of the most striking facts of the modern hospital treatment of parturient women is the still high percentage of women who have moderate degrees of fever during the puerperium in spite of most rigorous aseptic and antiseptic precautions.

The author has studied his case cards carefully and finds that the majority of women who have borne children suffer from physical damage due to childbirth. As a cause of uterine disease childbirth is much more frequent than gonorrhea. True vesicovaginal and other fistulae and complete perineal lacerations are more seldom met as compared with former times, but minor degrees of laceration prolapsus uteri etc. are no less frequent.

As a producer of invalidism and semi invalidism the lacerated cervix is more often culpable than a corresponding degree of perineal laceration. The patulous os allows the cervical mucous membrane frictional contact with the septic vagina, the open cervix permits the entrance of bacteria into the uterus, the diseased mucosa is a focus of infection, and even low grades of inflammation can produce bad after-effects.

Another structure whose physiologic and pathologic importance is not adequately appreciated is the web of connective tissue supporting the uterus, the bladder and the rectum. While masses of literature have been written on the levator and pelvic floor the importance of injury to this connective tissue supporting webbing has received scant notice. It may be torn or overstretched by the forces of labor or operative interference or it may be thickened and distorted by inflammatory conditions.

There is an idea prevalent that natural labor should be curtailed as much as possible. The old time-tried, time proved and time honored watchful expectancy in the conduct of labor has been replaced by a polypragmasia pernicious in its effects immediate and remote, for both mother and child. Methods to shorten the time of labor have been multiplied and great virtues have been claimed for them. Without doubt, protracted and painful labor does weaken the parturient and requires a longer convalescence but there are no permanent effects. In natural labor a few hours more or less makes no difference in the immediate recovery. Study of the rapidity of the recovery of women after delivery will show that the main factor in producing slow convalescence is the injury inflicted by labor or operative delivery.

First among the practices which should be condemned as meddling are attempts to cut short the period of dilatation of the cervix. The only way to dilate the cervix safely is nature's way. Manual dilatation always tears the cervix. Colpeurynters often do so and almost invariably if traction is put on them and in addition, they pull the cervix downward while the uterine action pulls it upward. Overstretching and dislocation of the cervix result and gynecologic and urologic disease follows.

Another form of interference is the indiscriminate use of twilight sleep gas and oxygen and other anesthetics. In the dispensary service of the Chicago Lying In Hospital postpartum hemorrhage is very rare in the author's practice it occurs much oftener due to the use of anesthetics. The same is true of the forceps operation. While the author seldom delivers a woman without some form of anesthetic, he is trying to reduce the amounts required to render the woman comfortable.

Another practice that should be eliminated is making the parturient bear down before the cervix is fully dilated and the head passed through it on to the pelvic floor. The dislocation of the cervix, the stretching of the paracervical tissues, is one of the potent causes of proclitania uteri. For this reason the author cannot sympathize with the revival, made at the New York Lying In Hospital of the obstetric delivery chair. Slow spontaneous delivery should be the object sought, not rapid delivery.

Too frequent vaginal examinations, ironing out the perineum must also be condemned. The danger of such manipulations is in the installation of mild infections which later lead to invalidism. For this reason rectal examination should be substituted for vaginal in nearly all cases of labor.

Of all the meddling practices giving pituitary extract is the most dangerous to mother and child. Sixteen cases of rupture of the uterus produced by pituitary extract are on record. Stowe reports two. Others have been recounted and the author doubts not that many more have occurred and have never been reported. Hardly a month passes but what a baby is lost in labor rendered pathologic by the use of pituitary extract. Lacerations of the cervix and perineum are frequent results of the violently rapid delivery under the influence of the drug.

Another form of meddling is the too frequent use of the cesarean operation. In some communities it seems that the only method the obstetricians know of solving the knotty obstetric problems is to cut them. The indication for section should be broadened in placenta previa, in eclampsia, and in the anomalies of the mechanism of labor. Yet one is appalled when so many flimsy indications for the frequent operation are discovered.

Even in the treatment of abortion there is too much meddling. It is usually possible to stop the bleeding and procure complete dilatation by

tampon, and yet it has been recommended to cut the cervix in such cases in order to empty the uterus.

EDWARD L. CORRELL

Holden F. C. *Obstetrics and Gynecology Under Ideal Conditions in a General Hospital.* *J. Am. M. Ass.* 9 6, LVII, 30.

The Greenpoint Hospital is located in a densely populated and growing section with a capacity of 300 beds devoted to the care of acute cases. It is a modern hospital with modern equipment made up of three departments medicine surgery and obstetric gynecology each of which is under the direct and continuous charge of a chief with well-equipped pathologic and roentgen ray laboratories under the care of paid residents and a trained resident in each of the three departments, six interns on a rotating service of two years, and fourth year medical students as clinical clerks.

The visiting staff consists of a gynecologist and obstetrician in chief in direct charge of a 50-bed service 5 obstetric and 25 gynecologic beds. The service is continuous. There are two associate gynecologist-obstetricians also on continuous service alternating every four months one being on the obstetric division while the other is on the gynecologic division. The dispensary staff is intimately associated with the hospital, one of the associates serving directly on this staff.

The house staff consists of a resident intern, and clinical clerks the resident being a well-equipped ex intern who serves for an indeterminate period of time.

The points about this service which the author wishes to emphasize are as follows:

1 A gynecologic-obstetric service of 50 beds under the supervision of one chief on continuous service.

2 A dispensary staff intimately associated with the hospital.

3 A house staff in charge of an experienced man who is not subject to a regularly recurring change.

The desirability even the necessity of these points in a modern hospital should be apparent.

EDWARD L. CORRELL

Garber J. R. *Significance of the Ammonia Coefficient in Obstetrical Work.* *S. M. M. J.* 9 6 LX, 300.

From his observations the author adduces the following conclusions:

The imperfect reaction of the maternal organism to the growing ovum is the usual predisposing factor in all cases of vomiting in pregnancy. Reflex or neurotic influences are usually the exciting factor.

True toxic vomiting is accompanied by serious changes in metabolism.

A high ammonia coefficient is not specific. It may indicate toxic vomiting or starvation following neurotic vomiting or an acidotic state to various causes. The ammonia coefficient is merely a danger signal and is always to be considered in connection

with the clinical symptoms. This is especially applicable to high coefficient. A low ammonia coefficient indicates neurotic vomiting and is readily treated by suggestion.

When there are slight variations of and a persistently high ammonia coefficient, a positive diagnosis of toxic vomiting is indicated. When the ammonia coefficient curve has wide variations sometimes falling to a low percentage, and is associated with pronounced nervous influences there is little doubt that one is dealing with neurotic vomiting.

Chloroform produces characteristic lesions of the liver and therefore should not be used as the anesthetic. The best anesthesia is nitrous oxide oxygen.

The determination of the non-coagulable nitrogen coefficient assists in differentiating renal from hepatic conditions. Its chief use is to indicate the extent of renal involvement. EDWARD L. CORRELL.

Hart, D B. The Hunch back or Gibbous Pelvis. *Edinb M J* 19 6 xvii, 150.

After reviewing the early literature on the hunch back pelvis Hart gives the following as special characteristics of that type of pelvis (1) the high position of the promontory and the flattening of the angle of the conjugate to the horizon (2) the changes in the sacrum (3) the changes in the brim diameters and upper pelvic strait (4) the changes in the lower strait and outlet. The changes in the sacrum are an elongation a narrowing and a lessened curvature.

The brim diameters are increased and the upper strait made larger than in the normal pelvis.

In the lower strait the side walls of the pelvis converge the pubic arch is narrow the ischial tuberosities nearer and thus the pelvic outlet is greatly diminished.

The author then gives an explanation of the anatomical and mechanical features which cause these changes.

He summarizes as follows

1 The so-called kyphotic pelvis is more accurately termed the hunch back or gibbous pelvis

2 The cause of the hunch-back pelvis is kyphosis of the spine in the lower spinal or spinal and sacral region.

3 All the changes in the pose of the hunch back and in its various pelvic straits can be explained on the mechanical principles already given and these were first clearly set forth by Breisky. There is nothing developmental in the pelvic changes found in the hunch back pelvis. D H BORN

Phase, E. D.: Fœtal and Placental Syphilis. *Am. J Obst N Y* 1916 lxxiv 562

The author gives the results of a study conducted at the Johns Hopkins Hospital. During the past four years he has performed autopsies on 75 babies dead from all causes and has studied the organs for the presence of the spirochete and the placenta for the histological evidence of syphilis. In 47 of the cases the Wassermann reaction was determined in the maternal serum.

The conclusions are as follows

The syphilitic placenta is characterized by increased size and weight, abnormal proliferation of the stroma cells, and an obliterative endarteritis and endophlebitis. For practical purposes the changes are specific and offer very strong evidence of the presence of fetal syphilis whereas their absence does not exclude the disease.

2 The demonstration of the treponema pallidum in the fetal tissues affords an absolute diagnosis of lues but the failure of demonstration proves nothing.

3 There are many discrepancies between the histopathological findings in the placenta and fetal tissues and the Wassermann reaction, and he believes that the complement fixation on the mother is of less value in accurately diagnosing fetal syphilis than the other two methods.

4. The diagnosis of fetal syphilis should be attacked from all points and absolute reliance should not be placed upon any one method. C H. DAVIS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Peaslee H. L.: Cysts of the Adrenals. T West Surg Ass St Paul, 1916 Dec

In reviewing the subject the author states that in the English literature the papers of Doran of London (*Brit M J* 1908) and Andrew McCosh of New York (*Ann Surg* June 1908) stand alone. In German C. Henshen's article (*Klin Chir* 1906 xlix) reviews practically all cases. Nothing appears since these dates.

Cysts are due to the well-known tendency of the adrenals to undergo hemorrhage hence we may with profit study the distribution of adrenal rests in the kidney, ovary and broad ligaments the possible cause of obscure hemorrhagic tumors of these parts.

Fourteen cases are reported in the literature of which seven were postmortem reports or were complications of other adrenal tumors. The other cases were well-defined blood cysts of the adrenal glands.

The author reports the case of a waitress with a history of right side pain of a cramping nature on several occasions—she thought five or six. A large tumor was present in the upper right abdomen, shock, pain, difficult breathing, rapid pulse—730 p.m. 80 830 p.m. 100 9 p.m. 120 930 p.m. 140.

Operation showed cyst covered with peritoneum attached to the back above the right kidney. The liver, gall-bladder, stomach, duodenum, and kidney were identified and were not concerned in the cyst. All organs were displaced by the cyst which was as large as an adult head. The sac was opened and contained about two quarts of blood fluid and two quarts of clots. Below the clots was a soft whitish mass which proved to be old hemorrhage. The sac was marsupialized. The patient recovered. The operation took place Dec. 5 1915. The patient was well one year later.

Colonna, G. Contribution to the Study of the Statics and Ptoisis of the Kidney (Contribuzione allo studio sulla statica e sulle ptoisi del rene) Glor d r Accad di med di Tor no 9 6 1914, 595

Colonna has made a number of experiments on cadavers, following the procedure carried out by Volkoff and Delitzsch in 1897 to determine especially the effects of intra-abdominal pressure on the mechanics of the kidney. The results of his investigations show him (1) that any visceral compression whatever including even a simple contact of the viscera against the kidneys, must in all circumstances be exercised against these organs (2) that the pres-

sure will naturally vary in strength and intensity according to the special conditions of the abdominal contents the position of the individual, and active muscular movements or simple tonicities of the abdominal walls and that while in exceptional circumstances the pressure may reach a high degree yet in ordinary conditions it is much less than is believed and such pressure exerts almost an unappreciable action on kidneys of ordinary size and weight.

His experiments have satisfied him that intra-abdominal pressure plays a very small part in the production of kidney ptosis. W. A. BRIDGMAN.

Lozin H. Kidney Wounds (Plaies d reins) Bull. et Mem Soc d chir de Par 9 6 1914, 1

Lozin's report was submitted by Leguen who stated in such reports as *conf equ* (10) as a general rule kidney injuries are only reported in conjunction with abdominal wounds of which they often constitute a complication.

Three cases are reported. In the first the injury was by a bullet and was benign. The bullet entered in the right hypochondriac region and issued in the right iliac region about 5 or 6 cm. from the median line. There were no particular symptoms and the man recovered without incident. The other cases were more grave—urine flowed through the wound orifice with consequent infection and aggravation of the general condition. On account of these complications Lozin in both these cases practiced a nephrectomy and he was convinced in his opinion that a spontaneous recovery would not have been effected. One of the patient recovered and the other who had extensive thoracic-abdominal injuries succumbed.

LEGUEN believes that discrete repeated hematuria suggests the presence of a foreign body in the kidney. Radiography can affirm it. But often such foreign bodies are in contact with the larger vessels and removal will compromise the kidney. Hematuria in itself is not a sign of the gravity of the kidney lesion. In fact it is almost inversely proportional to it, because it is natural, when the kidney is badly torn that the hemorrhage should pass into the perirenal space and that only a small part should pass through the ureter. In a kidney wound, therefore hematuria should not be awaited as an operative index. But it is not so when there is a primary discharge of urine from the wound orifice. This generally indicates either an injury of the ureter or a kidney wound and is a harbinger of infection. Under such circumstances there can be but little hope of a spontaneous reparation and a primitive urinary discharge of this kind is an indication for immediate surgical exploration.

Leguen however thinks that Lorin's views as to the necessity for nephrectomy in such cases is rather exaggerated. He has had under his own care three patients with kidney injuries, with prolonged and abundant discharge of urine through the wound and all have been cured without nephrectomy.

In the discussion the views expressed supported the opinion of Leguen. W A BRENNAN

Bugbee, H G. Traumatic Injuries of the Kidney and Ureter. *Ann. Surg. Phila.* 1916 luv 459.

The author has collected histories of over 100 cases of trauma of the kidney and ureter incorporating into his collection 8 personal cases. The following conclusions are reached:

1. The small number of recorded cases of traumatic injuries to the kidney and the ureter as compared with traumatic injuries in general, may be accounted for in part by the failure to make a correct diagnosis and in part by the fact that many cases are dismissed as cured following a period of rest and expectant treatment with temporary amelioration of symptoms.

2. A careful follow-up system would doubtless throw a different aspect on many of the cases treated expectantly and dismissed as cured as occurred with 3 of the author's series.

3. In all probability many cases of the vague symptom-complex, neurasthenia might be cleared up by a more careful study of the history and the symptoms in relation to the possibility of traumatic injuries of the urinary system, especially the kidney.

4. In no case where any of the evidence directs attention to this part of the body should too much dependence be placed on the cardinal symptoms as to their absence or presence.

5. Prompt and painstaking diagnosis and the application of treatment in accordance with the exigencies of each case will tend to lessen the mortality and the remote results of the injury and will lead to the conservation of functioning kidney tissue in many cases in which ultimate nephrectomy would otherwise be necessary. I S KOLL.

Jonas, L., and Austin, J H: Value of the Ambard Quotient in the Estimation of Renal Function. *Am. J. Med. Sc.* 1916, clll, 560.

The cases in which a study of the quotient derived by applying Ambard's formula as modified by McLean was made may be divided into three groups: (1) cases in which there was no clinical or laboratory evidence of nephritis nor marked vascular disease nor cardiac decompensation (2) cases with definite evidence of nephritis (3) a few cases with no definite nephritis but in which there was vascular disease cardiac decompensation or both.

They conclude that the Ambard formula in its original form or as modified by McLean does not express exactly the law of renal function with respect to the elimination of urea and that this is particularly true as regards the effect of urinary

urea concentration. The upper limit of blood urea in non nephritic and in normal individuals under ordinary conditions is about 0.35 gm. urea per liter of blood (Tilston and Comfort). Figures higher than this are, under ordinary conditions of diet to be considered evidence of impaired renal function.

In using Ambard's formula as modified by McLean, it was found that in the great majority of nephritic cases a lowering of the index was accompanied by an elevation of the blood urea above normal limits 0.35 gm. per liter and that the index afforded no information of diagnostic or prognostic value that could not be as readily deduced from the blood urea alone. In certain cases the index was found to be lowered when the blood urea was within normal limits. This was especially true in arteriosclerotic cases and in cases with cardiac decompensation which probably detracts from the clinical value of the index as compared with that of the blood urea rather than the reverse since it is of importance to distinguish between cases of a vascular and of a renal character.

In the determination of the index there is a possibility of error arising from incomplete collection of the urine an error which cannot occur in the blood urea estimation.

The urea index estimated repeatedly in the same individual exhibits wider variations in normal or non nephritic individuals than in nephritic.

The conclusion of these studies is that for purposes of ordinary clinical diagnosis and prognosis the estimation of blood urea is a more reliable and more useful guide than is the urea index or the Ambard quotient. E. K. AZAROV

Beer E. The Interpretation of Functional Renal Tests with Special Reference to the Significance of Minimal Excretion of Phthalein and Indigo-Carmin. *Ann. Surg. Phila.* 1916 lrv 434.

The patients who exhibit a low excretion of phthalein and indigo-carmin fall naturally into four classes. Their operability depends not so much upon the result of the primary test as upon the cause of the renal damage, the probable recuperative power of the kidneys when the cause of the damage is removed and the manner in which the operation is performed. The last should be so done that the least possible strain is placed on the kidneys; therefore nitrous oxide or spinal injection or local infiltration should be selected as the anesthetic and the operation itself should be performed with all possible speed.

Cases with renal damage due to such extrinsic causes as prostatic hypertrophy which show no improvement of function after the institution of regular catheterization or the establishment of a suprapubic fistula may not be operated upon. Similar cases showing improvement may be operated upon with comparative safety.

When the lowered output is due to inhibition, toxic or reflex but one kidney being the seat of demonstrable disease operation may be performed.

In cases of bilateral renal disease, the lowered output being due to lesions in both kidneys operation should be performed in the manner above described the better kidney being first attacked.

The author describes seventeen cases in considerable detail illustrating these four classes of conditions

S. W. MOOREHEAD

Heineberg, A. Uteroscopic Findings. *Am J Obst. N Y* 9 6 1901 63

From a study of the interior of the uterus in different conditions the author states that the normal mucosa is dark red in color and of a velvety appearance. It bleeds easily when subjected to even slight trauma. The pathological conditions which he has studied present the following features:

1 In chronic interstitial endometritis of the hemorrhagic type the uterine mucosa appears thin, not paler and less velvety

2 In chronic glandular endometritis especially when associated with polypoid degeneration the mucosa is thicker, paler and distinctly shaggy in appearance. The shagittacea is made up of small villous and polypoid masses which appear more distinct if viewed while the irrigating fluid is running into the uterine cavity

3 Isolated mucus polypa have about the same color as the normal mucosa and may present small dark areas of hemorrhage though this is rare. They engage in the opening of the uterus and may be seen to move in the irrigating stream.

4. Carcinoma of the corpus uteri. In the one case examined presented itself as many irregular, pale, yellowish and pink polypoid masses which filled the cavity of the uterus. The features which seemed to distinguish it from diffuse polypoid endometritis were the greater friability of the mass and more profuse bleeding when pieces of it were broken off with the end of the uteruscope

5 Chorion-epithelioma, of which he has examined but one case, was the only condition which presented a circumscribed bright red tumor

6 The distinctive feature of incomplete abortion is its mottled surface, on which yellow areas are irregularly interwoven with dark red or bluish red areas where the blood-clot has adhered.

C. H. DAVIS.

Fullerton, A. Use of the Opaque Ureteral Catheter to Localize Mistle in the Region of the Kidney and Ureter. *Brit. J Surg* 9 6, 1 78.

The author gives his experience in the use of the opaque ureteral catheter in determining whether a mistle is within the kidney or situated outside the organ. If actually in the kidney it should be removed but if in the perirenal tissues it may do no harm.

The X-ray can give only approximate results when a mobile organ like the kidney is under consideration. But the opaque ureteral catheter combined with stereoscopic radiography gives excellent results in the determination of a foreign body

The author reports two cases giving illustrations of this method of localization, in both of which operation confirmed the findings. W. E. LOWE.

Schilling, H. Hemorrhage at Urethral Catheter Insertion (*Blutung bei Ureterkatheterisation*). *T. M. Verh. S. 2 Cong. Goeteborg* 19 6, July

Red blood corpuscles are not important findings in urine collected by ureteral catheterization as they are present in 40 to 50 per cent of normal cases. In passing catheters into the ureters of 30 normal people the author found red blood-cells in 90 per cent of the cases (with a No. 7 lense, 2 to 3 red cells to a field). The hemorrhage is caused by the circular and longitudinal contractions of the ureter around the catheter. The longer the catheter is in the ureter the more likely the hemorrhage, therefore the first urine gives most accurate results. The hemorrhage is not prevented by putting oil on the catheter but the contractions of the ureteral musculature can be inhibited by atropine

In the discussion EKENHORN stated that in tuberculosis of the kidney he had observed that in catheterization of the ureters hemorrhage is much more likely to occur from the healthy side

L. A. JONES.

BLADDER, URETHRA, AND PENIS

Palouze, P. Cystoscopic Rectovesical Transillumination. *J. F. M. J.* 9 6, 477 742.

By inserting a cystoscope into the bladder dilating that viscus with a perfectly clear medium, turning off the cystoscopic light and inserting an electric bulb into the rectum it is possible to transilluminate the intervening structures. With this procedure the tiniest blood vessels in the base of the bladder can be seen distinctly and changes in tissue thickness can be determined readily by the varying intensity of the transmitted light.

In the normal condition the light is first seen in the midline about one and one-half centimeters posterior to the urethral vulva and can be followed laterally until it disappears beneath the ampulla and seminal vesicles or posteriorly far up on the bladder wall. The opening and closing of the ureteral orifices can be seen and in some cases, the ureter followed for quite a distance.

The method is of value in determining tissue infiltrations such as inflammation of the seminal vesicles and growths involving subvesical structures. It should also be possible to see stones in the lower end of the ureter

To avoid the possibility of burning the rectal mucosa a light carrier conforming to the rectal curves has been devised in which the light bulb is surrounded by an air chamber

Buerger, L. Tumors of the Bladder. *V. F. M. J.* 19 6 d 23

The author bases his report upon the study of 113 tumors of the bladder that have come under his

observation at the pathological laboratory of Mount Sinai Hospital during the past ten years, and more than 25 other vesical tumors he believes the statement, that the pathological diagnosis of carcinoma is possible in most cases.

Systematic and thorough pathological investigations of papillomata and carcinomata of the bladder forced the conviction upon the author that certain peculiar abnormalities in the conformation of the cells regularly mean the presence of either primary carcinoma or carcinomatous change in papilloma. The most characteristic of these abnormalities are cells manifesting irregularities in size and shape nuclei within chromatin cells with typical mitoses giant cells and multinucleated cells. Moreover corroborative evidence was found in a disturbed relationship of the cells to each other in a loss of the typical palisade arrangement of the cells in the presence of long fusiform or compressed types of cells in the existence of infiltration of the stroma and penetration of the basal membrane in the presence of cells in the capillaries and finally in the occurrence of the epithelial cells in the submucous or muscular coats of the vesical wall. All these changes when occurring in papillomata of the bladder indicate the presence or beginning of carcinomatous change and whenever such cells are present, a thorough search will often disclose other evidences of malignancy.

These morphological criteria are present in parts of the tumors that are accessible to diagnostic methods.

Most noteworthy are the author's views with regard to the long mooted question of a papilloma undergoing malignant change. That such a change takes place very frequently is demonstrated by the fact that in 13 out of his 53 cases of carcinoma 25 per cent a metamorphosis of papilloma into carcinoma occurred. This change takes place in accessible portions of the tumor or anywhere on the surface or in the deeper parts of the villi in the early stages the villi alone may be involved and villous changes may be accompanied by infiltration, by invasion of the deeper parts or by metastases in the capillaries. All these stages in the transformation of a papilloma into carcinoma could in the various specimens examined for that purpose be followed up to the point of complete transformation or even to the stage of an infiltrating carcinoma involving all the coats of the bladder wall.

The various changed papillomata are grouped into six types which are characterized by epithelial changes alone, by cell changes together with infiltration of the stroma or such associated with invasion of the capillaries of the stroma by cellular changes in the stroma and nests of cells in the pedicle, by exclusive surface epithelial changes associated with slight foci of invasion into the pedicle, and finally by surface changes with distinct carcinomatous change in the periphery of the growth.

In accordance with these histological findings the

various types of papilloma and carcinoma are grouped in papilloma infiltrating papilloma papilloma with early changes into carcinoma primary papillary carcinoma and finally primary squamous celled carcinoma.

The histological diagnosis of all these tumor varieties does not so much depend upon the acquisition of a large amount of material as upon the ability to detect and correctly interpret early morphological alterations characteristic of carcinoma. As a rule a reasonable amount of material is available either by the snare or for obtaining peripheral portions of the growth by the punch forceps or in case of sessile tumors by the cystoscopic punch forceps or the Young rongeur.

In this way, the author concludes that in most instances a differential diagnosis between vesical papillomata and carcinomata can be made on a pathological basis.

MARTIN KROSTENKA

Geraghty J T: Treatment of Bladder Tumors.

N Y M J 1916 civ 838

Geraghty presents a brief but comprehensive and lucid review upon the relative value of the various therapeutic methods of bladder tumors the report is based upon a series of 180 cases that came under observation at the Brady Urological Institute.

While from a histopathological viewpoint malignant papillomata are true carcinomata, they must nevertheless be placed in one class with the benign papillomata as regards their response to therapeutic measures. Experience at Young's clinic in recent years indicated that benign and malignant papillomata react equally favorably to fulguration. However there seems to be a marked difference in the promptness of response to fulguration between the benign and the malignant papillomata. While the typical benign papillomata, as a rule, vanish with astonishing rapidity malignant papillomata disappear very slowly and frequently require many times the amount of treatment which would be necessary for the benign forms of the same size.

Excision or resection of the bladder wall is to be considered as the *ultima ratio* and should be reserved for those cases (papillary carcinoma) in which intravesical fulguration treatment appears to be impossible. A very careful technique should be observed in the handling of these cases and measures be adopted to prevent implantation on the remainder of the bladder wall.

The systematic opening of the bladder with subsequent fulguration, offers no advantage over the intravesical procedure. As regards the percentage of recurrences the results to date at the Brady clinic seem to warrant the belief that a not inconsiderable proportion will be free as the tendency for recurrence grows progressively less after the first year.

Radium has been of great value in the treatment of malignant bladder tumors and the best results have been obtained when the radium was placed directly against the growth by means of the Young

radioscope while the rest of the bladder wall is screened.

The combination of radium and fulguration seems to promise much for the future. However radium has not yet given sufficiently encouraging results to warrant its employment in preference to resection in apparently operable cases.

Following resection cystoscopes should be performed at frequent intervals especially for the first year and recurrences if noted should be treated as early as possible by a combination of fulguration and radium. MARTIN KA TOY, LA.

Walker J W T. Treatment of Papilloma of Bladder by the High Frequency Current. *Brit J Surg* 9:161-59.

Prior to 1900 there were two procedures for treatment of papilloma of the bladder the open method by suprapubic operation and the intra-vesical method. Beer's new method of exposure to the high frequency current however revolutionized the treatment of this condition.

The author describes in detail his employment of the bipola current with the cauterizing electrode introduced along the catheter tunnel and the cautery pad in the suprapubic region, under the sacrum or on the thigh depending on the location of the growth.

In treating small papillomata the platinum terminal is applied directly to the growth being sunk into its center. The mass quickly whitens and part or all of it comes away on the point of the electrode. In a larger growth parts of it are destroyed at a time. The papillomata are insensitive and the passing of the current causes no pain. Care, however must be used to avoid touching the bladder mucous membrane. If the fluid medium becomes cloudy with blood and debris the bladder must be washed out before further application. At the end of the sitting a thorough irrigation with weak silver nitrate solution is advised.

The method is not without difficulty the position of the growth proving an important factor. The papilloma in the region of the trigone or near the ureteric orifice or low down on the posterior wall of the bladder is in an ideal location for treatment by this method. However it is difficult to reach a growth behind a fold in the bladder wall or in the neighborhood of the internal meatus. Enlargement of the prostate may also interfere with the necessary manipulation.

Not all growths of the bladder are suitable for treatment by this method. Certain multiple coalescing papillomatous growths had better be excised. Neither should this method be used in cases of malignant growths because the destroyed tissue on the surface is very rapidly replaced and the general effect of the current is to stimulate the growth of the undestroyed cancer-cells.

During a period of two years the author treated 33 cases of papilloma of the bladder with the high-frequency current. From one to eleven treatments

were given each patient. In fourteen of the cases, the growths were entirely destroyed in one sitting, while in only five were more than five treatments required. The danger of recurrence is no greater than after operative measures have been employed and the use of the high frequency current incurs a much less loss of time on the part of the patient. W E LOWE.

Thomas, G J. Diverticula of the Urinary Bladder. *Surg Gyn & Obst* 9:6 323-378.

The author reviews the embryology of the bladder and cites the opinions of various authors relative to the etiology of diverticula. Methods are discussed which have been developed from a clinical study of 2 cases. Previous infection, urinary symptoms, clinical and cystoscopic data, roentgen findings, medical and surgical treatment, complications, mortality and postmortem findings are taken up in detail.

Many writers maintain that the bladder is derived from the allantois while Prentiss and others believe that the organ is derived from the cloaca. The openings of most diverticula have been found at the point where union between embryonic structures should take place.

Diverticula may be divided into (1) congenital, the hour-glass and double split or blind bladder; (2) acquired divided according to their etiology into (a) intra uterine (b) obstacles to urination, and (c) traumatic.

At the Mayo Clinic cases of diverticula were observed up to November 1914. Of these 14 patients were operated on, 7 were not operated on, and 6 cases were found at autopsy. The average age of the patients was 35 years, the average age of onset of symptoms 43 years. Of the series 21 per cent had urethral stricture, 7 per cent had stricture, 4 per cent had had previous operations—upon the prostate, 3 explorations of the bladder—2 per cent had tumors of the suprapubic area or of the bladder.

There was difficulty of urination in 70 per cent, it was the first symptom in 40 per cent. Thirty three per cent had retention, 11 per cent had incontinence. Frequency was noticed in 85 per cent. Blood was a symptom at some time during the history in 29 per cent. Initially did symptoms begin in childhood.

The most noticeable clinical findings other than those of the urinary tract were loss in weight and strength. These occurred in 40 per cent and were secondary to urinary infection. Complete cystoscopic examinations were made in 19 cases. Marked cystitis was found in 24 per cent, cancer was found in 5 per cent, stone in 1 per cent, urethral stricture in 15 per cent and prostatic obstruction in 4 per cent. In 6 cases the openings of the diverticula were near the ureters—on the right side in 3 cases, on the left side in 4. In 6 cases the openings were found on the floor of the bladder—2 were near the urethra, 4 toward the posterior wall. In 2 cases the

openings were in the dome. An hour-glass bladder was observed in one instance. In 4 cases there were multiple diverticula. In 13 cases generalized trabeculation of the bladder was noted.

A leaded catheter may be introduced into the diverticulum to demonstrate its outline in the cystogram. In the Mayo Clinic this has proved the best method of demonstrating diverticula.

In suspected cases a cystogram taken after injection of opaque fluids will demonstrate diverticula in a large percentage of cases. Care must be exercised in exposing the plates so that the shadow of the diverticulum is not superimposed upon that of the bladder.

Medical treatment is palliative and should be used only when surgical methods are contra indicated. In the series reported 14 patients were operated on. The diverticulum was resected in 6—extrapentoneal 4 intrapentoneal 2. Drainage preliminary to resection was done in 2 cases in 6 drainage operations only or the diverticular openings enlarged.

Surgical complications were cancer stones in the bladder benign hyperplasia of the prostate and urinary infection. Perforation was found in one instance only a report of this case is included in the original paper.

In the cases resected there were no fatalities, in cases complicated with stones carcinoma, or marked renal infection the mortality was high. At necropsy marked pyelonephritis was found in 80 per cent of the cases a severe grade of nephritis was found in 78 per cent.

The conclusions are as follows:

1 The embryology of the bladder has not been definitely determined and incomplete development accounts for the pathology in but a few cases. In some instances the condition may be congenital, but other factors seem necessary before symptoms develop.

2 In the cases described the average age of onset—43 years—would indicate that acquired factors (obstruction 86 per cent) seem necessary for the development of diverticula clinically.

3 Trauma was a factor in 22 per cent of the cases.

4 The cystogram and leaded catheter are of great aid in diagnosis and may be the only positive findings.

5 Surgery is the best method of treatment. The choice of operation depends on the location and size of the diverticulum.

6 When resection is possible the mortality will be negative. In complicated cases the mortality will be high because of renal and vesical infection.

Magni E.: Peritoneal Inundation of Urine the Reparatory Power of the Bladder (L. inundazione peritoneale di urina. Il potere di riparazione della vesica). *Clin. ch.* 1916 xxiv 812.

The author reports two cases. The first was a vesical calculus in a woman with a consequential vesicovaginal fistula. Magni did an epicystotomy

extracted the calculus and closed the wound thinking that the fistula would suffice for the evacuation of urine from the bladder. This however did not occur and on the second day there was peritoneal inundation of purulent urine. A drain was placed and the alarming phenomenon subsided. The patient was in good condition after two months the bladder being capable and elastic.

The second case was a vesical neoplasm which necessitated an almost total cystectomy the vesical neck and trigone alone remaining. There was a peritoneal inundation of urine but without grave consequences. After about a month the patient left the hospital the hypogastric wound being closed and the patient being able to urinate spontaneously and not too frequently the specific sign of neoformation of a bladder.

The two cases demonstrate that peritoneal inundation of even purulent urine does not always have the grave consequences which some attribute to it and also that the bladder has an extensive power of repair.

W. A. BRENNAN

Prior S: Experiences Regarding the Clinical Value of Goldschmidt's Posterior Urethroscopic Examination (Erfahrungen ueber den klinischen Wert der Goldschmidtschen Urethroskopia posterior). *Tr. XI North Surg. Cong.*, Goeteborg 1916 July.

The author briefly discussed the urethroscope and its principle, the optical apparatus and irrigation by means of it after which he discussed the appearance of the healthy urethra. He emphasized the importance of the neurologist's being able to determine whether a sexual neurasthenia rests on a pathological basis or not. The different forms of urethritis were then discussed and the endoscopic findings in chronic prostatitis. Its importance to the surgeon was also mentioned making it possible not only to diagnose accurately *Mercier's barriere* and urethral tumors but also to treat them with the galvanocautery.

He emphasizes the fact that a much earlier and more detailed diagnosis of prostatic hypertrophy is possible by means of it and that it can be differentiated from carcinoma and atrophy of the prostate. In the latter condition a galvanocauteric incision of the bladder orifice should be tried before Freyer's prostatectomy is performed.

L. A. JUNKER.

GENITAL ORGANS

Cunningham J H Jr: The Treatment of Genital Tuberculosis in the Male. *Surg. Gynec. & Obst.* 1916 xxiii, 385.

The author's report is based on postmortem and clinical data. Thirty five postmortem examinations of the whole genital tract show that in the presence of tuberculosis of the epididymis similar lesions exist in the prostate or vesicles in nearly every instance that tuberculosis of the kidney and bladder are often present that lesions in the vesicles

and prostate often exist when the lesions are not detectable by the usual methods of clinical examination.

Clinically in 86 patients the lesions were palpable in the vesicles in 41 and in the prostate in 49 and the examination of material expressed from these structures showed the tubercle bacillus in smears in less than 5 per cent of the cases examined. Of these 86 cases the bladder and kidney were examined in 51, the bladder was tubercular in 16 and one or both kidneys infected in 6. In this series the lungs were definitely infected in 67, 3 had hip tuberculosis and 5 Pott's disease.

A consideration of the literature both post mortem and clinical bearing upon this subject confirms the author's findings that tuberculosis of the epididymis is associated with tuberculosis of the vesicles and prostate in most instances and that the upper urinary tract is frequently infected further that the disease in the genital system is usually secondary to a tubercular process elsewhere in the body. The author believes that these facts must be taken into consideration in treatment and that a complete examination of the individual as well as the urinary system, by cystoscopy and urethral catheterization, or at least a catheter specimen of the bladder urine, should be a part of the routine study prior to the consideration of operation. He points out that the destruction of the local focus is but the first step in the process of treatment and that the whole problem of treatment is one of immunizing the individual as surgery can not free the patient of the disease as such but the removal of accessible foci by surgery renders the patient more amenable to the methods of immunization.

After considering the end results by the methods of treatment previously employed Cunningham advocates castration or epididymectomy as the case may indicate and the destruction of the lesions in the vesicles and prostate by injecting about one dram of crude carbolic into the vas deferens, so as to reach the disease in the vesicles. Following the operative procedure attempts to immunize the

patient against the remaining tubercular process by tuberculin and hygiene should be continued indefinitely. The results of this form of treatment are better than by other methods.

Sofia A.: A Case of Tuberculosis of the Epididymis Treated by Durante's Method (Sopra un caso di tubercolosi dell'epididimo guarito con la cura alla Durante) *Gazz. d. esp. d. cl.* Milano, 96, xxxvii, 20.

Sofia reports a case which he believes to have been undoubtedly true tubercular epididymitis and which was treated by iodine injections according to Durante's method. In the course of one and a half years 8 injections were made in the body of the epididymis and more than 300 hypodermic injections.

After the treatment the epididymis appeared to be of normal volume and no longer showed any symptoms of disease. W. A. BRENNAN.

MISCELLANEOUS

Laurenti T. Partially Calcified Fibrolipoma of the Perineal Region (Fibro-lipoma, parzialmente calcifico della regione perineale) *Gazz. med. d. Roma*, 96 xlii, 98.

The perineal region, like all regions in which adipose tissue exists, may give rise to lipomata but in this region they are only rarely developed and may be wrongly diagnosed if there is not an accurate objective examination.

The author reviews the literature of the subject since the first observation by Malogodi in 1838 down to date and reports a personal case in a man of 59, who 8 years before had noted a cyst like swelling in the left section of the scrotum mobile and indolent but which continually increased in size. For about a year he had had urinary disturbance. After an incision over the tumor it was found implanted on the superficial perineal aponeurosis. It was totally nucleated and was found on microscopical examination to be a calcified fibrolipoma.

W. A. BRENNAN.

SURGERY OF THE EYE AND EAR

EYE

Plaza, H. L.: Tumor of the Interpeduncular Region (Tumor de la region interpeduncular) *Prensa Méd Argent.* 1916 III, 112

The author reports the case of a man of 30 who came to his neurological clinics with ocular troubles, which had commenced in December 1915 with double vision in certain directions. Later there was difficulty in raising the upper left eyelid the eye remained closed and on raising the lid objects were seen double. Examination showed the left pupil larger than the right with immobility and absence of accommodation. A Wassermann examination of the blood and spinal fluid being positive the patient was put on specific treatment. The condition gradually became worse. The right eyelid was affected then the limbs became involved so that the patient became unable to walk and passed into a comatose state. By March, 1916 he showed Weber's syndrome of paralysis of the left ocular region and right hemiplegia. The hemiplegia and somnolency increased. Spasmodic movements in the limbs were observed with Babinski's sign bilateral. The patient died in April.

Autopsy confirmed the diagnosis of tumor of the interpeduncular region of a probably tuberculous nature on account of the patient's antecedents. There was a tuberculoma a little larger than a nut in size at the level of the interpeduncular zone.

W. A. BRENNAN

Morre, V. and Moreau F.: Etiology of Ocular Wounds in War (Étiologie des blessures oculaires par projectiles de guerre) *Ann d'ocul* 1916 XLIII, 31

The authors report on ocular wounds in war is based on their personal experience since the month of September 1914. Since then they have observed 698 traumatic lesions of the visual apparatus by projectiles or weapons. 341 were shell injuries, 191 bullet injuries, grenade wounds, 82 bombs, etc. 63, miscellaneous, 21.

Whatever may be the nature of the projectile loss of vision is brought about in five different ways (1) by contusion whether direct or indirect (2) by rupture of the ocular membranes with or without penetration (3) by global infection after injury of the ocular tissue (4) by section of the optic nerve or of the oculomotor nerves (5) by intracranial lesions involving the optic centers. The authors discuss these causes in detail.

Of the 341 shell wounds 75 were due to large fragments of projectile, 96 to middle sized, and 170 to small fragments or metallic dust. Of the 191

bullet wounds 153 were due to the complete bullet entering the eye and the others were fragmental bullet injuries.

Of the total 698 eye injuries only in 160 cases was useful sight retained or restored in the injured eye. Enucleation had to be practiced in 293 cases.

W. A. BRENNAN

LoBlanco F.: Primary Tuberculosis of the Eye (Sulla tubercolosi primitiva dell'occhio) *Gazz med di Roma* 1916 XLII, 258.

Tubercular lesions of the conjunctiva as of the iris and choroid are not rare yet it has not been determined at the present time whether such lesions are primary in origin or are secondary to some tuberculous processes of the organism. LoBlanco has undertaken experimental researches to elucidate this point. His experiments have been made on guinea pigs, the material used being a pure culture from human tuberculosis in gelatinized agar the virulence of which was tested and proved.

The animals were divided into four series (1) controls (2) animals having the right palpebral conjunctiva scarified (3) animals with superficial scarification of the cornea of the right eye (4) animals with deep scarification of the cornea of the right eye so that true ulceration was effected thereby.

The results obtained by LoBlanco from his various experiments are summarized thus (1) Koch's bacillus if deposited on a healthy conjunctiva does not provoke tuberculosis. (2) The placing of tuberculous bacilli on a previously scarified conjunctiva develops a conjunctival tuberculosis with subsequent tuberculosis of the iris of metastatic nature. (3) Simple disepithelialization of the cornea does not permit the penetration of tuberculous germs deposited on the conjunctiva into the ocular globe. (4) With deep scarification of the cornea, Koch's bacilli placed on the conjunctiva will penetrate the interior of the eye and thus occasion a tubercular panophthalmitis. (5) It is impossible to develop a primary ocular tuberculosis in a healthy eye. (6) A simple inflammatory condition of the eye does not permit the attacks of Koch's bacillus a traumatism is necessary to allow a port of entry to the germs.

W. A. BRENNAN

EAR

Babcock, H. L.: Aural Complications in Contagious Diseases. *N. Eng. M. Gaz.*, 1916 II, 552

Considering the entire series of cases the author has found aural complications most frequent in scarlet fever with 8.19 per cent somewhat less in

measles, with 5.23 per cent and very low in diphtheria, with only 0.82 per cent.

Of the total number of cases of aural involvement 13.8 per cent went on to mastoiditis requiring operation. In the suppurating ears complicating diphtheria, a pure culture of the Klebs-Loeffler bacillus was frequently obtained. Otto M. Rott

Campbell, D. M. Labyrinthitis—Report of Cases in Acute Suppurative Otitis Media and After Operations. *J. Mich. St. M. Soc.* 9:6 xv 48

Labyrinthitis is classified as (1) circumscribed labyrinthitis (2) diffuse serous secondary labyrinthitis (3) diffuse purulent manifest labyrinthitis (4) diffuse purulent latent labyrinthitis (5) traumatic labyrinthitis (6) serous induced labyrinthitis. These are more or less phases of one process and in the course of events these types may run the one into the other.

The author reports two cases of serous induced labyrinthitis complicating acute suppurative otitis media, both relieved by simple mastoid operation and one case of diffuse serous secondary labyrinthitis developing the thirty sixth day following a simple mastoid operation relieved by a radical tympano-mastoid exenteration. Two cases developed symptoms of labyrinthine disharmony upon recovery from the anesthetic following the radical tympano-mastoid exenteration both of which showed improvement from day to day so no further surgical interference was necessary.

The diagnosis of purulent manifest labyrinthitis should be made by the entire absence of all labyrinthine reactions and should be promptly drained in acute cases and in chronic cases as part of the radical operation in the presence of a dead labyrinth. *Editor J. P. Mason.*

Gradenigo, G. A Case of Cerebellar Otic Abscess Diagnosed and Cured (Sopra un caso di nuovo cerebellare otite diagnosticata e guarita). *Gazz. d. Accad. d. med. e. Tor.* no. 9:6 lxix, 245

The case reported by Gradenigo which occurred in a girl of 1 was one of the rare cases in which the cerebellar otic abscess was not complicated by other encephalic lesions and in which the characteristic symptomatology appeared in all its clearness.

Generally grave alterations of the labyrinth are coexistent which by their peripheral vestibular symptomatology mask the symptomatology of the central vestibular lesions. In other cases the cerebellar abscess complicates an infective thrombosis of the sigmoid sinus, the characteristics of which may also hide those of the abscess. In a final category of cases there coexists with the abscess lesions due to purulent circumscribed leptomeningitis.

In Gradenigo's case the most important symptoms

on which the security of the diagnosis was established were (1) the constant absence of fever and the failure of Kernig's sign besides rigidity of the nape of the neck. This latter was evidently due to compression of the rachidean bulb against the occipital foramen due to the abscess (2) the symptoms of notable augmentations in the endocranial pressure, especially manifested by the alterations in the ocular fundus and by the paralysis of the diseased side (3) more especially by the existence of nystagmus usually directed toward the diseased side (irritative phenomenon) and the contemporaneous functional integrity of the corresponding labyrinth.

W. A. BRIDGMAN.

Gradenigo, G. Acute Mastoiditis and Facial Paralysis (Mastoiditis acuta, paralis facialis). *Gazz. d. Accad. d. med. e. Tor.* no. 9:6 lxix, 245.

Lesions of the facial nerve are frequent in diseases of the ear and the long course which this nerve follows across the temporal bone gives ample reason for it. There are three categories of cases: (1) lesions of the nerve in the internal auditory canal accompanied by lesions of the cochlear and vestibular nerves (2) cases where the nerve is injured in its course along the vestibular walls (3) cases where the facial nerve is injured in its descending tract, by infection of the mastoid cells.

Gradenigo describes a case which he recently treated where facial paralysis was combined with phenomena of very acute otitis media. The diagnosis was difficult. In the course of the operation he was able to establish that the descending portion of the facial nerve was in direct contact with a small cavity the walls of which were clearly diseased.

On the morning following operation the facial paralysis was much attenuated and the mastoid pain had ceased. Fourteen days later there were no traces of paralysis. In the first days of the illness it was thought that the otitis and the paralysis might be two distinct phenomena, but the developments and especially the fact that there was a spot painful on pressure circumscribed to the anterior portion of the mastoid apophysis corresponding to the intramastoid course of the facial nerve caused Gradenigo to think that the nerve lesion had a mastoid origin and this determined operative intervention. Although the otitis might have subsided spontaneously it is probable that in such event the facial paralysis would have remained more or less permanent. After drainage of the suppurated mastoid cavity the result was a rapid, progressive, and complete recovery. Gradenigo therefore recommends that in cases of facial paralysis with acute accompaniments an accurate examination of the middle ear and mastoid cavity should be made.

W. A. BRIDGMAN.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Baxter G. E. A Clinical Study of Sixty Cases of Postnasal Infection in Private Practice; Report of Six Cases Complicated by Acute Hemorrhagic Nephritis. *Arch. Pediat.* 1916 xxviii 729

An analysis of the 60 cases shows that complications occurred in 58 so that practically all cases of postnasal infections have some form of complication. Of these complications otitis media occurred in 42 cases, or 70 per cent. In the first two years of life 24 out of 29 cases had otitis media, or about 80 per cent from three to five years 60 per cent and in six to eight years a little over 50 per cent. Of the complications aside from otitis media, cervical adenitis was most frequent occurring in 20 cases—33½ per cent. Adenitis occurred in about one third of the cases in the first two years of life 40 per cent from three to five years and about 45 per cent from six to eight years the adenitis being more frequent in the older children.

The next complication in order of frequency was nephritis occurring in 6 cases, 10 per cent 5 of which were of the hemorrhagic variety and reported in detail in this paper. Only 1 case occurred in a child of two years all of the others occurred at the age of six to eight years. The analysis of the 42 cases of otitis media shows that about 55 per cent occurred in the first years of life and during this period other complications were less frequent. About 80 per cent of all the postnasal infections in the first two years had otitis media 55 per cent of the postnasal infections at three to five years, and 55 per cent at six to eight years. Whereas, the occurrence of otitis media was less frequent during the period from three to eight years, the occurrence of other and more serious complications was more frequent. Of the 42 cases of otitis media, 17 had paracentesis done or about 40 per cent. Two of the patients who were most severely ill had a paracentesis done early. About 65 per cent of the cases occurring in the first two years were not operated on.

From the ages of six to eight years however there were twice as many operative cases as non operative. Of the 4 cases of acute nephritis 2 had otitis media and a paracentesis was done in both cases 2 cases had had a tonsil and adenoid operation prior to the infection, 1 had a double otitis media and the other a cervical adenitis 2 cases were in one family. Three cases have been operated on for tonsillitis and adenoids since the attack.

It seems safe to conclude that the middle ear in infants is vulnerable to this attacking organism and that these infants are less subject to all other

kinds of focal and general complications. Their chances of recovery are more than equal whether a paracentesis is done or not. Exception would undoubtedly be taken to this statement but the author's records show that the cases without drainage through the external auditory canal recovered as quickly and as completely as those which drained either as a result of paracentesis or spontaneous rupture 15 cases without drainage and 0 cases with drainage. In several cases in which both ears were involved paracentesis was done in the one ear and not in the other and no appreciable difference was noted in the period of recovery.

In older children however this will not hold true. With a postnasal infection with or without accompanying otitis media complications were much more common and severe in character. Of the group of 21 (aged six to eight years) which suffered complications 7 cases showed involvement of the urinary tract 6 with an acute nephritis and 1 with pyelitis or 33½ per cent. EDWARD L. CORNELL.

THROAT

Lynah H. L.: Tracheobronchial Diphtheria. *Laryngoscope*, 1916 xxvi 1193

The author lays great stress upon the frequency with which this condition is mistaken for bronchopneumonia because of the fact that early in the disease there is no laryngeal involvement, hence the absence of the typical laryngeal stridor which would make one suspect the true nature of the disease.

He states that if the possibility of this condition is kept in mind more cases of supposed bronchopneumonia will be subjected to bronchoscopy and the true condition recognized.

In the majority of these cases the primary formation of the membrane takes place in the bronchi, usually on one side, and the clinical evidences are ballooning of the chest on the side of the obstruction hyperresonant percussion note due to emphysema, the latter due to the valve like action of the membrane permitting ingress of air but obstructing the egress. Asthmatic dyspnea is present, absence of bronchial breathing on the obstructed side and hoarse bronchial breathing on the free side, are also evidenced. The latter finding causes many mistaken diagnoses as this phenomenon influences the examiner to call the disease bronchopneumonia but if the other signs are sought and found the true nature of the disease will be recognized. There are present early in the disease evidences of cyanosis, particularly of the finger tips.

When the tube has been passed and the membrane discovered the author uses the suction tube

in preference to forceps for its removal as the forceps cause breaking off of the membrane. After the membrane has been removed the area is sprayed with antitoxin followed by intubation with long tracheobronchial intubation tubes which are removed within 72 hours. Antitoxin is of course injected.

The author adds 38 detailed case reports of this interesting condition. **Otto M. Rorr**

Iglauer S. Plea for the Electrocautery in the Treatment of Laryngeal Tuberculosis. *Laryngoscope* 9 6 xvi, 1 37

The author bases his plea both on clinical and experimental evidence. Concerning the clinical evidence it is pointed out that more ultimate cures are obtained with this method than with any other procedure.

The experimental evidence depends upon the fact that besides destroying tissue there is produced around the area cauterized an inflammatory reaction which goes on to the stage of fibrous and connective tissue formations, thus encapsulating the lesion producing a healed focus just as normally occurs when nature heals in a tuberculous process.

This work is not advised if the pulmonary condition is progressive if there is high fever, frequent hemorrhages, and much cough. On the other hand, the best types of cases are those in which the pulmonary lesion is in the early stage and running a slow course without fever.

The author favors the suspension method of obtaining access to the area. **Otto M. Rorr**

Moore, I. The Operation of Laryngofissure; Some New Instruments Specially Designed for Improving the Technique. *Lancet* Lond 9 6 cxd 675

Statistics covering the last 25 years show such progress and brilliant results in cases of early cancer of the interior of the larynx, especially in the vocal cord area operated by thyrofissure, that the author expects to obtain a lasting cure in 80 per cent of cases in the future.

Appreciating the fact that while diagnosis and technique have improved in these cases the instrumentation has been lacking, the author has designed the following satisfactory instruments: a thyroid gland clamp, tracheal shears, thyroid cartilage shears and saw, self retaining thyrofissure retractor and intralaryngeal forceps and scissors.

ELLEN J. PATTERSON

Ballin, M. J. Laryngeal Abscess. *N Y M J* 19 6 cl 78

Laryngeal abscess, an infection of adult life may be primary or secondary, intralaryngeal or extralaryngeal, bilateral or unilateral though the majority are extralaryngeal and unilateral, located on the left side.

They usually run a rapid course giving rise to symptoms of dysphagia and dyspnea and the prognosis depends upon the site of the abscess and

early diagnosis made by the sudden onset of the subjective symptoms and the laryngological picture.

Treatment consists in relieving the pain and feeding of fullness and tension in the throat first by conservative measures and later by surgical measures in the larynx and in extreme cases by tracheotomy. **ELLEN J. PATTERSON**

Adams, F. Window Resection of the Larynx for the Removal of Intrinsic Malignant Disease. *Northwest Med* 9 6 xv 330.

The operation referred to is that devised by Lamber Luck whereby after elevating the perichondrium from the thyroid cartilage to be removed, the cartilage with the underlying mucosa and affected cord are cut away after which the perichondrium is stitched over to the opposite side. This procedure is preferred to thyrotomy because:

1. Thorough removal of the disease is ensured by the free view of the parts which is obtained. The removal of the cartilage underlying the growth makes for additional thoroughness.

2. The rapidity of the operation and the ease with which the bleeding is controlled diminishes the great danger of the operation namely blood entering the air passages and causing difficulty with the anesthetic during the operation and subsequently septic pneumonia.

3. After the operation the patient is able to swallow perfectly just as after a simple tracheotomy. In the ordinary thyrotomy to obtain sufficient access it is often necessary to divide the thyrohyoid membrane and to pull the two halves of the larynx forcibly apart as a result of which the patient may have difficulty in swallowing and fluids are very apt to enter the air passages causing sepsis and septic pneumonia.

4. Healing is rapid and there is less apt to be necrosis of the cartilage as all the cartilage which has been bared of perichondrium has been cut away. In thyrotomy a piece of cartilage, from the inner side of which the perichondrium has been stripped is left and before healing is complete a small sequestrum occasionally forms and comes away.

5. The after-results are excellent the voice is good and it returns even more quickly than after thyrotomy.

In the case reported, there was no difficulty in swallowing after the operation and no pain.

The tracheotomy tube was left in for two days only. The voice was good due to the formation of fibrous tissue which took the place of the vocal cord removed. **Otto M. Rorr.**

MOUTH

Waldron, C. W. Follicular Odontomata of the Superior Maxilla. *Surg Gynec & Obst* 9 6 xiii, 473.

The initial incision through the mucosa under the lip is high up toward the reflection of the mucosa.

After removal of the cyst walls the antrum is opened and an opening made into the nose through the inferior meatus, through which the drainage is carried out. The oral incision is closed with interrupted fine catgut sutures. The author feels that by this method of drainage the postoperative course is greatly shortened and the discomfort, pain and dread of repeated oral dressings are avoided. The drain through the nose is removed in from twenty four to forty-eight hours. Any ill effects upon the nasal mucosa are negligible. Orro M. Rorr

Smith T S Periodontal Septic Foci *Calif St J Med* 9 6 xiv 356

The author offers the following conclusions

1 Periodontal diseases are so common that we rarely find an adult person who has absolutely healthy gums. These diseases develop so insidiously however that their presence is usually not detected until they have reached an advanced stage.

2 Periodontal diseases apparently are the result of some pathogenic microbic infection which begins in the gingival sulcus but these organisms require a traumatic condition to provide them with a path of entry. The traumatism is usually the result of purely local causes. Systemic conditions however may exert a slight contributory influence.

3 It has not yet been proven that any one organism is the specific cause of periodontal lesions on the contrary the appearance of the lesions suggests that they may be caused by different organisms.

4 Endamebae are usually found in periodontal lesions but the majority of investigators believe that they are harmless secondary invaders of the pockets.

5 Periodontal septic foci endanger the health of the body because they contain several strains of pathogenic organisms having highly differentiated elective localization properties and the organisms can readily enter into the circulation from these foci.

6 Correct prophylactic care will always prevent periodontal diseases.

7 Periodontal diseases are not cured unless the pyorrheal pockets have been completely obliterated. It has been found that the separated tissues will form a vital reattachment to the roots of living teeth and obliterate these pockets if aided by proper surgery.

8 This reunion of the tissues cannot be brought about by antiseptic and endamebicidal agents and if they are used as an aid to surgery they impair the tissues and prevent rapid healing. Orro M Rorr

Baker R H: Cylindroma of the Tongue *Surg Gynec & Obst.* 1916 xliii 356

Two cases of cylindroma are reported as being unique in their origin in the tongue. Conclusions to be drawn from these cases are

1 That they arise from abnormal proliferation of blood and lymph capillaries and spaces.

2 That the endothelial lining of these capillaries

and spaces gives rise to a secretion of some material with the staining reaction of connective-tissue hyaline.

3 The hyaline substance may be distributed centrally or peripherally to the secreting cells.

4 The excessive proliferation of the vascular elements meeting the resistance of the firmer connective tissue framework and the increasing resistance of the hyaline material tends to assume a twisted convoluted structure.

5 The increasing tension within these convolutions from proliferation and excessive hyaline formation causes an impaired vascular supply to the tissue and ultimate necrosis of the endothelial cells and tends also to restrict the nutrition of the connective elements, with resulting sclerosis and hyaline degeneration.

The clinical history of such tumors combined with their microscopical study tends to the view that the cylindroma is a definite tumor entity of endothelial type. It is a slow growing tumor with frequent recurrences but lacking in metastasis. Its clinical manifestations usually occur in adult life but it may very probably be considered as of embryonic origin. All descriptions of cylindromata as other than endotheliomata may be accounted for by the frequent mistaken observations on mixed tumors showing areas of cylindromatous degeneration. True cylindroma may be classified as an endothelioma cylindromatousum or anglioma cylindromatousum.

Scott, J R: Tuberculosis of the Tongue. *Am. J. M. Sc.* 1916 ciii, 411

The author has been able to collect 231 cases of tuberculous tongue up to the present time. A large series of autopsy reports justifies him in concluding this to be a rare condition. In America, he has been able to obtain access to the reports of 27 cases. He gives in detail a report of a soldier a private in the Signal Corps, aged 32 years. Four years previous he had noticed a small, elevated white area on the left border of the tongue he applied tincture of iodine twice a week for a few weeks. Wassermann tests had always been negative. Examination of the lungs showed them to be unaffected. Sputum was found positive for tubercle bacilli March 7 1915. A small portion of the ulcerated area was excised and sent to the pathological laboratory of the United States Army Medical School for microscopic study and diagnosis and it proved to be tuberculosis. The impressive factor of this case was the existence of lingual lesions for a period of over four years, during which time the man was examined for evidences of pulmonary tuberculosis, with negative results.

The disease occurs in all periods of life, although the majority of the reports of cases show the age period to be from forty to fifty years. The earliest reported age was that of a child of five and a half years. Males are more frequently affected than females due perhaps, to the fact that trauma is an important predisposing factor.

Concerning the etiology the author believes the essential factor to be a deposition and proliferation of the tubercle bacilli in the tissues of the tongue however he divides the disease into two main forms, primary and secondary the latter being by far the most common. He believes that trauma of the tongue, occurring in a patient suffering from pulmonary tuberculosis, may lacerate the tissues, directly inoculating them by the passage of bacilli laden sputum with direct deposition of the same in such an exposed area. Carious teeth, carrying various objects in the mouth biting the tongue, and perhaps, smoking may be the causes of such trauma.

The author believes that the infection may be carried to this area in one of the three following ways (1) by direct inoculation (2) through the blood stream (3) through the lymph stream. He believes inhalation to be a negligible factor.

Primary tubercular ulcer is more rare than the secondary form. In his series of collected cases, he was able to find only 16 undoubted cases of the primary form. Tubercular ulcerations of the tongue are very indolent not appearing to enlarge with any rapidity nor responding to local treatment there is, at first, a slight enlargement of the tongue and very little pain later the tongue becomes more swollen and it surface is covered with grayish mucus soon upon appearance, which is only relieved upon the ingestion of solid food but after varying periods of time the pain becomes intense mastication is impossible and liquid diet must be provided which also fits time causes pain and discomfort even simple phonation is attended by excruciating pain. Coincidentally with the painful phonation salivation appears. The tubercular lesion is generally localized in the neighborhood of the tip of the tongue but may occur on the border of that organ or on either the superior or the inferior surface at varying distances back from the tip most frequently it is found upon the superior surface. Generally, there is but one lesion the onset later one or more may be present.

In appearance, the lesion is small round, slightly elevated, covered by normal mucosa. The form of the nodules is frequently irregular when small they are rather round or oval, when large they are rectangular or very irregular in outline. The nodules rapidly break down in the center and form ulcerated areas whose walls are generally abrupt and frequently undermined. The surface of the ulcer is covered with sticky mucus, removal of which reveals a gray or yellowish red sometimes a red ulcerating surface which presents small, hard round prominences, suggesting granulation of tissue. As other ulcers form in the vicinity of the first they break down and may coalesce to form large, irregular serpiginous, ulcerated areas. Frequently the process may involve the lymph-glands.

Scott also describes the tubercular process which occurs in the form of granuloma as well as the fissured and papillomatous form.

The signs of the disease include the evident lesion the lymph-glands beneath the jaw are usually enlarged cachexia being occasionally seen, more often in cases where the lingual tuberculosis is secondary to pulmonary tuberculosis. There is some night sweating, loss of weight, and a general feeling of fatigue, but it is difficult to say how much of these symptoms are dependent upon lingual lesions and how much upon the primary disease.

The differential diagnosis is often a matter of considerable difficulty. It should be made only after a microscopical examination of the material from the lesion. Simple ulcers of the tongue, local manifestations of syphilis and carcinoma, must be considered where microscopical differentiation is very difficult. A special staining method for demonstrating tubercle bacilli should be used, or a piece of tissue may be injected into a guinea pig.

The prognosis is dependent upon many factors aside from simple ulceration of the tongue. If taken in the earlier stages, and the patient is not suffering from pulmonary tuberculosis in the advanced stage surgical removal of the diseased tissue of the tongue has resulted in an apparent cure in other cases the prognosis is very bad. According to von Ruck, however when tuberculin is administered the prognosis becomes fair.

In the medical treatment of the lesions, the medical profession formerly placed its faith in caustics of various kinds potassium iodide has been much used without permanent effects roentgen and ultraviolet rays have furnished no grounds for hope in their ultimate success. As yet radium has not been sufficiently used to warrant an opinion.

At the present time the majority of medical men use surgical treatment, where the lesion occupies the anterior portion of the tongue, it is now the practice to remove a V-shaped piece going far beyond the limits of the actual lesion. Where the greater part of the tissue of the tongue is affected, it becomes necessary to amputate. Simple curettage is not advisable the actual cautery is a better method of local conservative treatment.

From the study of the subject Scott concludes (1) Tuberculosis of the tongue is more common than is generally supposed. (2) It occurs in males more frequently than in females. (3) It occurs in all ages, but is more common during the decade from forty to fifty years. (4) It occurs in two forms, primary and secondary the larger number being secondary. Clinically it may assume different types of disease, as ulcerated, fissured, granulomatous, and papillomatous. (5) Differential diagnosis involves consideration of simple ulcers, the local manifestation of lues, carcinoma, and epithelioma. (6) Treatment may be medical or surgical. The former offers little hope of ultimate cure. The rational treatment is surgical with complete excision of the involved tissue and the surrounding healthy tissue for some distance.

ESTHER C. ROBINETTE.

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SURGERY OF THE HEAD AND NECK

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DURING recent years a strong trend towards the study of physiology has been noted and following the great advances made in pathology and in surgical technique during the past twenty years there has developed quite logically a great interest in biochemical investigation. This has led necessarily to a new concept of normal organic function and with this re-awakened interest a strong desire to measure the efficiency of such function. While this investigation has been taken up most vigorously by that group of clinicians classed as internists the work is of no less value to the surgeon. Indeed it may safely be claimed that from now on both the internist and the surgeon are to be dependent upon the biochemical laboratory that here may be concretely expressed that borderland where all branches of modern medical practice have a common interest.

The estimation of organic efficiency is of the utmost importance to the surgeon and about this theme an extensive literature has developed out of which clarified conclusions have not yet been formulated. We desire to call the reader's attention to an effort at such formulation for presentation in the following number of the INTERNATIONAL ABSTRACT OF SURGERY. In his review covering functional tests pertaining to the stomach and duodenum to appear in the April number the author Dr. MAX KAHN has amplified a thorough and painstaking review of the literature by bringing to bear the results of his own experience as biochemist in the Pathological and Research Laboratories of the Western Pennsylvania Hospital of Pittsburgh.

INTERNATIONAL ABSTRACT OF SURGERY

MARCH 1917

COLLECTIVE REVIEW

GASTRIC AND DUODENAL ULCER

By R. C. COFFEY M.D. F.A.C.S. PORTLAND OREGON

THERE has been no more interesting chapter in the development of modern surgery than that of the surgical treatment of gastric and duodenal ulcers. It has probably been more interesting because it is not entirely a surgical subject such as gall stones, intestinal obstruction, hernia, fibroid tumors or cancer but is a field claimed with some justification by the medical man. Not only has the rivalry thus engendered helped to give zest to this subject, but also the acknowledged fact that gastric ulcer is not influenced alone by mechanical conditions and that the actual cause and nature of gastric and duodenal ulcer has been so elusive as to evade the searchings of the scientist even up to the present time.

We are accustomed to look upon surgery for the treatment of gastric ulcer as something very new while as a matter of fact, Rydygier (1) as early as 1881 excised an ulcer on the posterior gastric wall which was adherent to the pancreas. The patient made a good and permanent recovery. This was followed in 1882 by transgastric excision of large ulcers on the posterior wall of the stomach by both Czerny (2) and VanKeef (3). Among other Continental surgeons Schuchardt (4) Roux (5) Mikulicz (6) Navarro and Maydl had performed excision of gastric ulcer until Comte (7) of Geneva, in 1885 was able to gather from the literature 38 cases of excision of gastric ulcer with 9 deaths and with cure or great relief in the 9 cases which recovered.

But the first brilliant surgery for gastric ulcer was reported by the eminent French surgeon

Doyen (8) before the German Congress of Surgery in 1895. At this time he reported 21 consecutive gastro-enterostomies by himself without a death and 12 gastro-enterostomies by other surgeons with one death — 3 per cent in all. In most of the cases there was a conspicuous improvement or an entire cure. Doyen considered at that time that the operation cured by abolishing the reflex spasm of the pylorus, which he believed was the chief factor in causing dilatation, hæmatemesis, and perforation. But the operation of gastro-enterostomy was understood before Doyen's work. Wolfier and Billroth both performed the anterior operation as early as 1881 and Von Hacker introduced posterior gastro-enterostomy in 1885. Billroth (18) January 25 1881 performed the first successful pylorotomy for cancer and both he and Czerny as well as other German surgeons, strongly advocated early pylorotomy for non-malignant ulcerations, from the very beginning and pylorotomy was actually performed for gastric ulcer several times in the late 80's and early 90's according to Greig Smith (12) one of the most alert abdominal surgeons of his day who set forth in a very complete way the status of the surgery of gastric ulcer in his book in 1897. From this it is clear that practically all of the fundamental steps which have been found useful in the later development of the surgical treatment of gastric ulcer were suggested and carried out in Continental Europe long before this time. Among these procedures may be mentioned (by way of recapitulation) the simple excision of ulcer, transgastric excision of ulcer

resection of the pylorus for ulcer exploratory gastrotomy local treatment of ulcer anterior gastro-enterostomy posterior gastro-enterostomy pyloroplasty

Here, however after having furnished the fundamental ideas for the surgical treatment of gastric ulcer the Germans, because of the great mortality accompanying the methods then in vogue, let the advancement of surgical treatment pass over to the hands of the practical American and English surgeons to work out the refined technique. Their methods decreased the mortality to a point where the operations seemed justifiable for it was during the 90's that Senn brought out his bone-plates, Mayo Robson the bone bobbin Murphy his button (10) Maunsell his through-and-through suture the elder Connell his suture and it was about 1901 that Gregory Connell put on the finishing touch by perfecting and popularizing the through and through suture and demonstrating by experimental surgery that it was perfectly safe.

It was at this point from 1900 to 1901 that the practical clinical surgeons headed by Robson and Moynihan in England and the Mayo brothers, in this country took up the work that had been done by the Continental surgeons and began to standardize it. It is probable that Mayo Robson was one of the first to make a successful clinical application of surgery to ulcer. In Mayo's papers the first reference to the surgical treatment of gastric ulcer *per se* was mentioned in his paper *Surgical Treatment of Diseases of the Stomach* February, 1900. In this paper he reported his first two cases of gastro-enterostomy for relief of open ulcer with satisfactory results. In 1901 he reported 11 cases of gastro-enterostomy for open ulcer with one death, using the Murphy button. It was about this time that Finney proposed his pyloroplasty which is undoubtedly the most original and valuable single step that has been taken in gastric surgery by an American. It was about this time also that Moynihan then Robson's assistant, came on the scene with his brilliant work. He first introduced the holdlag-clamps into this country in 1903 and from that time on held the same relative position in England that Mayo did in this country in the development of the surgery of gastric ulcer.

Mikulicz came over about 1903 and demonstrated his modification of the Peterson operation, using the short loop.

Moynihan in December 1904 proposed a definite plan in which the jejunum was applied to the stomach downward and to the right—

named by Mayo Moynihan's line. The writer was present when W. J. Mayo did his last long loop operation with entero-anastomosis and severing the intestine between the entero-anastomosis and the gastro-enterostomy by Doyen's method and also when he took up the short loop operation, similar to the one just described by Moynihan, but which he stated had been done by Charles H. Mayo in 1903 just after the visit of Mikulicz. This particular operation was then adopted and used in the Mayo Clinic until July of the same year when W. J. Mayo after an extensive study of the direction of the jejunum as a means of preventing the then prevalent vicious circle, proposed the application of the jejunum to the posterior wall of the stomach downward and to the left. Moynihan very soon afterward modified his original dictum of downward and to the right by applying the jejunum to the wall of the stomach directly downward. With these modifications the technique of the operation of gastro-jejunostomy was complete and this technique has not been materially improved upon since.

It is a grave question many at this time whether much of the effort to improve upon this by revising such procedures as excision of the ulcer excision of the pylorus end of the stomach, blocking of the pylorus have not been to a great extent useless and worse than useless in most cases. When Paterson (70) dared to make such a statement as this before the Clinical Congress of Surgeons in Chicago in 1913 many American surgeons who heard him rather pitied the poor benighted little English surgeon who seemed so far behind the times but a larger experience since that time coupled with that of others who have had a much larger experience than mine has convinced me that we were probably the ones who were behind the times, in that we had reverted from the perfected gastro-enterostomy operation of Mayo and Moynihan to the first work of Rydiger (1) Czerny (2) and others.

OCCURRENCE OF GASTRIC AND DUODENAL ULCER

There is no accurate way to estimate or even to approximate the frequency of peptic ulcer except at postmortem.

Weir (44) in collected reports of 45,860 autopsies found gastric ulcer 421 times duodenal ulcer 108 times. About 0.2 of one per cent of the deaths were due to perforating duodenal ulcer. Of Kinnicut's 30,000 autopsies 0.4 per cent died of perforating duodenal ulcer. Wille (36) found signs of gastric and duodenal ulcer in 1 per cent of cadavers. Grober (35) in 4,208 necropsies, found peptic ulcer in 4 per cent of cadavers. W. Schmidt

(38) in 109 child cadavers found duodenal ulcer in 18 per cent. In 2715 necropsies in older persons he found duodenal ulcer in 17 cases — 0.65 per cent.

Concerning the age at which peptic ulcer occurs, the literature is somewhat bewildering. We have in the past been inclined to consider peptic ulcer chiefly a disease of young adult life. Very little attention has been paid to peptic ulcer in young children and in the old. When we come to investigate the subject, however, we find that it is very much more frequent than we had expected in the extremes of life. Weir quoting Collins' statistics on 297 cases of duodenal ulcer says that the ulcer occurred in persons under 10 years of age 42 times, in the second decade 24 times, in the third 42 times, in the fourth 52 times, in the fifth 46 times, in the sixth 41 times, in the seventh and eighth 8 times above the eighth 3.

Eusterman (47) found that the average age of males presenting themselves for surgical treatment at the Mayo Clinic was 47 years and females 44.5 years, the average duration of symptoms had been 9.8 years, making the average age at which the ulcer began about 36 years. This referred to gastric ulcers. In duodenal ulcers the average age was 43 years, the average duration of ulcer symptoms, 12 years, making the average age at which duodenal ulcer symptoms developed 31 years.

Joslin (40) 1914 in 234 cases of gastric and duodenal ulcer found that the average age of male patients presenting themselves for surgical treatment was 40 years and 2 months, the average age of female patients presenting themselves was 36 years and 4 months. The average age of onset of symptoms in males was 30 years and 8 months, in females 30 years and 10 months.

Cackovic (151) in 175 cases operated upon in his clinic found that 23.2 per cent of the patients were under ten years of age, while 55 per cent were under fifteen years of age.

Lund (150) in 1909 operated upon a boy 8 years of age for perforating gastric ulcer.

Helmholz (149) said that he had found duodenal ulcers in 8 out of 16 infants who had succumbed to marasmus. A number of other observers have noticed the frequency of duodenal ulcers in marasmic infants. This would raise the question as to whether the duodenal ulcer might not be the cause of the marasmus in these cases.

Kuttner (148) in a report of cases of ulcer in infants suggests the possibility of congenital pyloric obstruction in infants being secondary to

an ulcer which has caused the reflex spastic condition of the pylorus. Clinical observation of these cases of pyloric stenosis leads to the conclusion that this is probably not true although we have no way of proving the contrary at the present time.

It seems that operators are generally coming to recognize the greater frequency of ulcers in old people. We formerly thought that it was very rare to find a simple ulcer in a very old person. In Joslin's 234 cases he found that 21 of the patients were over 60 years old when first seen. One of them was 86 years old. I am quite certain that in recent years I have seen even a greater percentage of simple ulcers in old people than Joslin reports.

Experience has caused a change of our opinions concerning the relative frequency in males and females, even more marked than the change in our opinions of the relative ages at which ulcer occurs. Until surgery became prevalent for treatment of peptic ulcer it was thought that about 75 per cent occurred in females. Joslin (40) in his 234 cases found ulcer in 192 males and 42 females. Finney and Friedenwald (43) in 200 cases of surgically treated gastric and duodenal ulcer found that 119 were in males and 81 in females.

In my own 150 cases 86 of the patients were males and 64 females.

It is interesting to note the change in statistics of the relative frequency of peptic ulcer in male and female as observed in the Mayo Clinic. Mayo (2, 1) in 1903 reviewing 303 operations on the stomach found 42 per cent in males and 58 per cent in females. In 1904 he found 41 per cent in males and 59 per cent in females but quotes Taylor as finding 2 per cent in males and 28 per cent in females. Eusterman (47) giving statistics from the Mayo Clinic for the years 1913 and 1914 reported 1078 operatively demonstrated cases of gastric and duodenal ulcer. Of the 264 cases of gastric ulcer 171 were in males and 71 in females, approximately 66.3 per cent in males and 33.7 per cent in females, while in 814 cases of duodenal ulcers in the same series 71.2 per cent were in males and 28.8 per cent in females, showing that the relative frequency of duodenal ulcer in the male is much greater than that of gastric ulcer. In fact, the relative frequency of ulcer in the male as compared with the female bears a very striking relation to our knowledge of the greater frequency of duodenal ulcer for we note that the relative frequency in the sexes began to change at exactly the same time that the relative frequency of gastric to duodenal ulcer changed for Mayo (29) as late as

1904 stated that his cases showed 12 per cent duodenal ulcers and 88 per cent gastric ulcers. In the same paper he stated that of 39 cases of duodenal ulcer 32 were in males. In December of the same year Mayo noted the increasing frequency of duodenal ulcers, for he stated: "In the past year we have found 27 per cent duodenal ulcer" and quoted Moynihan who had found in 100 recent cases that 22 per cent were duodenal.

Following Mayo's papers up to Fueterman's paper just quoted a gradually increasing frequency of duodenal ulcer is noted.

Mayo (215) in a more recent paper calls attention to the maliness of the duodenal ulcer as compared with the gastric ulcer and expresses the view that many of the duodenal ulcers have been overlooked because of this fact. It is true that European surgeons and most American surgeons have not been able to find such a preponderance of duodenal ulcers as have been shown by the Mayo Clinic and Moynihan, both of whom have been leaders in their respective countries in this line of work and without doubt, are able to recognize some ulcers that the average surgeon, paying no particular attention to gastric surgery, might overlook. But even in the hands of the average general surgeon there are certainly more duodenal than gastric ulcers and the relative frequency increases as knowledge of the subject grows and becomes more nearly accurate.

Concerning the location of gastric ulcers Mayo's statement in 1904 (25) that 75 per cent of all gastric ulcers were located in the pyloric end of the stomach will now have to be greatly modified owing to the fact that a great many of the 75 per cent then classified as gastric ulcers would now be classified as duodenal ulcers so that after all the change in relative frequency of duodenal ulcer may be in a large part due to change in classification.

Concerning the location of gastric ulcers MacNevin and Herrick (34) reporting on 100 postmortem specimens of peptic ulcers found that 48 per cent of the ulcers occurred on the lesser curvature, 31 per cent on the posterior wall, 1 per cent on the anterior wall, 3 per cent on the greater curvature, 733 per cent occurred on the lesser curvature and posterior surfaces.

Welch quoted by Mayo (28) in 793 cases of postmortem examination of ulcers found 235 ulcers on the posterior wall, 248 on the lesser curvature, 96 on the anterior wall, 95 in the pyloric ring, 2 in the fundus, 27 along the greater curvature.

Welch's statistics and MacNevin's are thus seen to be about the same as regards location.

From what I am able to learn from trustworthy statistics of operating surgeons, and from a limited experience it would seem that the findings at the operating table are very similar to those at postmortem.

Concerning the location of duodenal ulcer it is generally agreed that probably 95 per cent occur in the first two inches.

ETIOLOGY

Although more than half a century has elapsed since Pasteur demonstrated that the fundamental cause of many diseases of plants and animals was some form of parasite or micro-organism and proved his theory by the destruction of the micro-organism and the resulting cure of disease, we are still groping in darkness as to the cause of many very simple and ordinary diseases.

It would seem that scientific men observing that when the true cause of a disease has been discovered it is always a micro-organism of some kind would finally quit following false gods and devote their time more earnestly to bacteriology, which almost unerringly leads to the cause of disease. It is almost pitiable to read the various theories as to the cause of tuberculosis prevalent until Robert Koch demonstrated the tubercle bacillus, also the theories as to the cause of malarial fever and the method of its transmission until it was demonstrated that it was caused by an organism transmitted solely by the mosquito, the theories of puerperal sepsis, diphtheria, typhoid fever and the various forms of surgical sepsis were equally ridiculous and led to all kinds of blundering in an attempt to treat the result of the disease rather than to seek out the disease itself. Occasionally a genius like *Little Oliver Wendell Holmes* and *Loeffler* has arisen to lead us out of one muddle, only to find us falling into another similar one. In the treatment of appendicitis and gall-stone diseases we have followed our usual stupid plan of being satisfied with the treatment of the terminology without looking for the cause.

It is probable that no disease or condition has called forth more ridiculous theories as to its cause than gastric and duodenal ulcer.

A. L. Benedict (50) in a very able article written as late as 1905 classifies ulcers under eleven headings, according to their causation:

1. Peptic ulcers, found in anemic, neurotic, overworked women.

2. Erosions caused by chemical and thermal caustics.

3 Ulcers due to organic vascular lesions, such as embolism thrombosis or obliterative inflammation of vessels.

4 Catarrhal ulcers, probably due to vascular disease and probably related to so-called eczematous affections of the skin

5 Varicose ulcers, due usually to portal obstruction.

6 Toxic ulcers occurring in scurvy purpura jaundice and typhoid infection.

7 Vicarious menstruation.

8 Gangrenous ulceration.

9 Phlegmonous ulceration of the stomach.

10 Specific ulcers syphilis tuberculosis actinomycosis etc.

11 Traumatic ulcerations due to crushing injuries Internal lesions, and animal parasites.

In addition to these various theories of ulcer Palermo (53) suggests that when solution of continuity occurs in part of the stomach wall which is free from glandular formation the lining epithelium is unable alone to accomplish regeneration of the lesion owing to the lack of glandular elements to co-operate in the work. The corroding action of the gastric juice soon induces ulceration at the point of lesion.

Marchetti (54) lays much stress on paralysis of the vagus, entailing stagnation of the contents in the part of the stomach involved as an important factor in the production of ulcer

Durante (54) produced experimental peptic ulcer by section of certain of the splanchnic nerves.

F C Mann (54) produced lesions in the stomach and duodenum in 90 per cent of animals by removing the suprarenal glands.

Ophuls (57) believes that most ulcers are due to disease of the arteries of the stomach. He bases his opinion on postmortem findings.

Ury (59) and Soper (62) have noticed a direct relation between epigastric hernia and ulcer. Soper claims that an indurated ulcer discovered at operation was entirely relieved by the repair of an epigastric hernia

Pierson (71) a captain in the United States army reports cases of gastric ulcer originating in his camp in Alaska in a few months, resulting from rough nitrogenous food poorly cooked un-mixed with vegetables and accompanied by a very hard life and extreme cold. Profuse hemorrhages occurred in three of the cases. All of the ulcers healed promptly when a normal well-balanced diet was restored

Kehrer (81) and Ierthes (82) take the ground that the chronic spastic action of the sphincter of the pylorus or other action may shut off the

blood supply of a given area of gastric mucosa and wall to such an extent that self-digestion takes place, and an ulcer results.

Willard Stone (73) believes that organic decomposition of sugars and starches plays an important role in the production of hyperchlorhydria with gastric and duodenal ulcers and suggests that an excess of sugar and starch diet of English and Americans is the probable cause of the greater frequency of ulcer in these countries.

A committee, composed of the leading surgeons and gastro-enterologists of Europe writing to a similar American committee, composed of a dozen of the ablest gastrologists in this country in 1912 stated. Even if we have been successful in producing gastric ulcers experimentally with all of their characteristic signs, yet the etiology of gastric ulcer in man is practically unknown.

One can readily appreciate the despair expressed by this committee, for certainly such an array of theories as to the cause of gastric ulcers, as I have just set forth, is enough to discourage the most optimistic, and is a repetition of the attitude toward the etiology of tuberculosis malaria, surgical sepsis, etc.

However an ever increasing ray of light is beginning to shine through our despair in the work of Rosenow on focal infections. It is true that many have, in an uncertain way suggested the relation between focal infections and gastric ulcer. I have been told that A. J. Ochsmier has for more than twenty five years been pulling teeth and removing tonsils as part of his routine in the treatment of any form of peptic ulcers.

W Bruce Clark (51) Thesen (56) Sherron (39) and many others have taken the ground that oral sepsis plays a very important part in the formation and perpetuation of peptic ulcer

I have seen Moynihan, as long as five years ago removing the appendix in every case of gastric ulcer and gall bladder disease.

Every one, of course is familiar with Lane's theory that all ulcers of the stomach and duodenum are caused by intestinal stasis.

Turck (55) Singer (68) and others claim to have produced ulcers in animals by the feeding of colon bacilli accompanied by bad hygienic surroundings. The proof offered by these various authors however is not convincing

N W Jones (217) made a pathological study of two postmortem specimens of stomachs of patients who had died from gastric hemorrhage from small mucous erosions (Einhorn's disease). The histories of the patients showed the same seasonal exacerbations as are noticed in true peptic ulcer. The bleeding usually took place in

the winter and the patients would practically recover during the summer. Of one of the specimens he says "On the posterior wall about midway between the cardia and the pylorus were seen five small eroded areas with hemorrhagic margins and bases. They were superficial in character not extending to the submucosa, and varied from the size of a split pea to 1.5 cm. in length and $\frac{1}{3}$ cm. in width. No eroded vessels could be found.

Concerning the microscopic examination, he says "The two cases present the form of a chronic gastritis characterized (1) by a dense small round cell infiltration in the interstices of the glandular elements which when extensive obliterates the gastric glands by pressure (2) by the disintegration of the cuticular portion of the mucosa as the crypts are displaced by the small round cells and (3) by the fact that with the disintegration of the cuticula and crypts the congested vessels are exposed and ruptured which accounts for the gastric hemorrhages occurring during the clinical course of the disease.

In the light of Rosenow's work Jones is now convinced that these mucous erosions, which produced the hemorrhage in these cases, have exactly the same etiology (hematogenous infection) as that found in true gastric ulcer.

Undoubtedly the most scientific and convincing work that has been done on the subject is that of Rosenow. So valuable is his work that it is not amiss to quote the conclusions from two of his articles.

Rosenow (10) in November 1913 after detailing his experiences with experimental study of streptococci in relation to ulcer gives the following summary:

Intravenous injection of streptococci of the proper grade of virulence may be followed by ulcer of the stomach and duodenum. The ulceration is due to a localized infection and secondary digestion. The ulcers are usually single and deep with a marked tendency to hemorrhage and perforation, and resemble the human gastric ulcer in many respects. When we take into consideration this close resemblance, that injection of streptococci which have grown in tonsils produce the lesion and the virulence of the germs when the affinity for the stomach is greatest is of such character that a general infection does not occur it appears altogether reasonable to suppose that in man gastric ulcer may be caused by streptococci also. The supposed relation between the infected tonsils or gums and gastric ulcer may be due not to the swallowing of bacteria, as usually supposed but to the entrance into the blood of

streptococci of the proper kind of virulence to produce local infection in the wall of the stomach. Many other observations might be cited, such as associated infections of the gall-bladder and appendix which suggest that gastric ulcer may be due to streptococci.

Rosenow and Sanford (73) 1915 give results of cultures and of histologic examination of tissues in a series of ulcers and lymph-glands draining the ulcers excised at operation in 31 cases. Chronic appendicitis was associated with the ulcers in 7 of the cases, cholecystitis in 5, pancreatitis in 3. Cultures made from the walls of the ulcers in 24 cases gave a pure culture of streptococci from 9 and mixed with other organisms, in all but one of the remaining 15. In 2 cases of duodenal ulcer not removed the streptococcus was isolated from a thin layer of peritoneum directly over the ulcer and from one from the hyperemic parietal peritoneum directly opposite the ulcer. Non-hemolyzing staphylococci were isolated in ten cases, but never in pure form.

The authors, from the almost constant occurrence of streptococci in the depths of human ulcers, commonly more numerous the younger the ulcer and the more marked the cellular infiltration to the total or almost total exclusion of other bacteria and from the fact that when injected into animals such streptococci show a marked tendency to localize in the stomach or duodenum a property which other strains of bacteria do not possess and lastly from the clinical facts, conclude that the evidence is good that streptococci are commonly the original cause of ulcer and also the important factor in preventing healing.

Other experimenters, as well as Rosenow have failed to produce true ulcers by any form of inoculation of streptococci into the stomach wall or mucosa.

Willenky and Geist (75) after making artificial traumatic ulcers, and injecting streptococci and other bacteria, which had been cultured from human ulcers after the method of Rosenow into their bases, and in some instances repeatedly injecting the bases of the ulcers, found that the ulcers healed just as quickly as if no bacteria had been injected into them at all.

Steinharter (77) injected staphylococci into the stomach wall of rabbits, in some cases with acetic acid and in some cases without. While abscesses would form in the wall of the stomach and sloughing take place, he was not successful in producing a true ulcer of the chronic variety.

Another prevalent theory as to the cause of

ulcer is the hydrochloric acid theory. There is good ground for this theory for it has been proved by long clinical experience that an ulcer will not develop and remain in an alkaline medium for instance we rarely if ever hear of a well authenticated chronic ulcer (unless it be syphilitic) that is maintained in the stomach of an achylic but the fact that a traumatic ulcer does not become a typical chronic ulcer even in the presence of excessive hydrochloric acid proves that hydrochloric acid is not the only cause and certainly is not the primary cause.

The *modus operandi* of the cure of a peptic ulcer by a gastro-enterostomy or by the Sippy alkalizing medical treatment, certainly lends weight to the theory that hydrochloric acid is at least an essential in the perpetuation of a chronic peptic ulcer. Sippy's (78) theory as to the development of a peptic ulcer is seemingly the most rational that has been given.

A circumscribed area of the mucous membrane of the wall of the stomach or adjacent duodenum through malnutrition or necrosis, loses its normal resistance to the action of the gastric juice and becomes digested. The resulting defect is an ulcer.

Sippy accepts the work of Rosenow as proof that hematogenous bacterial invasion is the most common factor in the malnutrition and necrosis. He believes, however, that the ulcer would heal the same as any other open lesion but for the solvent action of pepsin on albuminous substances that have been properly permeated by hydrochloric acid. This statement I think very admirably sums up the present opinion of most students of this subject as to the etiology of gastroduodenal ulcers.

DIAGNOSIS

Kronlein (86) in 1906 in discussing 116 cases of round ulcer said that he had discovered no pathognomonic symptom. If the assumed gastric catarrh persists for years, in spite of treatment an ulcer can be surmised even if there are no traces of hemorrhage. Occasionally these patients with chronic catarrh die of perforation of an unsuspected ulcer.

This statement graphically illustrates the state of knowledge of the diagnosis of peptic ulcer as acknowledged by one of Europe's greatest authorities only so far back as ten years ago.

There is no phase of the ulcer question which has developed more during the last ten years than the question of diagnosis. Prior to ten years ago the important features taken into consideration were hemorrhage vomiting gastric residue.

As a consequence of our limited knowledge, the majority of peptic ulcers were not diagnosed. This was particularly true of duodenal ulcers. Pain which we now recognize as the most important and frequent objective symptom was then almost ignored and the older symptoms on which the diagnosis was made, have been found not so important. For instance taking up the question of pain, Friedenwald in 1000 cases found pain in 94 per cent of all cases. The tender point was in the epigastric region in 980 cases. A dorsal tender area together with a tender epigastric spot in 537 cases. Hall (92) found pain in 82 per cent of his cases. Tenderness in 70 per cent. Elliot P. Joslin (40) found pain in 74 per cent of cases. Eusterman (108) found pain in 85 per cent of cases. It is probable that the question of pain was formerly overlooked because of the fact that in duodenal ulcer the pain nearly always comes on three hours or more after the meal and is relieved by the taking of food hence the name hungry pain applied by Moynihan. It is now the most important symptom connected with the diagnosis of ulcer for even in gastric ulcer the hungry pain is noted in a considerable percentage of cases, and the pain comes on after an hour in nearly all cases.

On the other hand hemorrhage connected with gastric ulcer is not nearly so frequent as we formerly supposed. Friedenwald found it present in only about 25 per cent of cases. Joslin in 30 per cent of cases. Eusterman of the Mayo Clinic, in 25 to 27 per cent.

Gastric residue is found in not over 20 per cent of cases in the average statistics, and in duodenal ulcer the residue is often much less and often even hypermotility exists.

The symptomatic diagnosis of duodenal ulcer is one of the most delicate things connected with abdominal diagnosis. The phenomena connected with duodenal ulcer have been so graphically set forth by Moynihan and also by Christopher Graham that I can do no better than to give in his own words Moynihan's description of the symptoms of a duodenal ulcer and Graham's differential diagnosis between duodenal ulcer and gallstone disease. It would be well for every physician to have these descriptions framed and hung in his office.

Moynihan's (88) description of the symptoms of duodenal ulcer is as follows:

The patient tells you that he has certain definite attacks and if you take the history given in detail letting the man tell his own story, he will give you the impression of having read something which has been written about duodenal

ulcer which he is recounting to the best of his ability to please you. He says that his trouble comes on in attacks which are nearly always worse in winter than in summer and are very apt to be precipitated by a chill. Let us follow the patient through the day. He takes a meal at eight in the morning and from two to two and a half hours afterward he is fairly comfortable. It is his best time. At the end of that time he has a feeling of discomfort in the epigastrium. He feels full and heavy and may get some relief from the belching of gas. Some of these patients develop a habit of belching. They may bring up a very sour fluid which tastes very bitter and acid and makes the mouth dry and the teeth chalky. This pain gradually increases until the next meal comes. To this I some years ago applied the term of hungry pain. At the next meal the patient almost instantly gets relief and that relief persists for two or three hours again. He probably eats a heavy dinner and he will nearly always tell you he has something before he gets into bed—a glass of milk, or a cup of cocoa and a biscuit. He sleeps comfortably until he wakes about 2 a.m. He gets relief from nibbling a biscuit which he keeps at the bedside. The pain is found to be most relievable by something stodgy and indigestible. Taking an alkali relieves the pain so will emptying the stomach by washing it out. If these symptoms which I have described are recurrent you can diagnose duodenal ulcer.

If there is anything to be added to what Moynihan has said it is to emphasize still more strongly the recurrence of the attacks with an entirely free interval between attacks, which led W. J. Mayo a number of years ago to remark jocularly that he would never think of operating upon an ulcer case until it had been cured medically at least seven times.

Moynihan in discussing the differential diagnosis, like Graham, calls attention to the fact that with gall-stones the patient nearly always has a spasm of the diaphragm with a catch of breath in an attack of pain. This is not true with ulcer.

Christopher Graham (87) giving the differential diagnosis between duodenal ulcer and gall-stone disease, states:

To sum up we may say that pain in cholecystitis is sudden and severe usually has a wide field of radiation comes with no regularity as to time is rarely caused by food and is rarely eased by it, nor does the patient often trace his distress to it. There is no stomach history between the short sharp attacks spasm of the diaphragm with dyspnoea is common vomiting and gas if pres-

ent, are so only during the colic, and the relief from eructation and vomiting is not so marked as in ulcer. Nausea and intense retching may be followed by a small amount of thin, yellowish, bitter liquid mixed with mucus. In duodenal ulcer pain comes on in periods of attacks lasting for days or weeks, is often sudden may be severe, yet usually not that intense type of pain met in gall-stones, but rather gnawing and burning in character. It may be irregular as to the time of separate attacks, but regular during the period of stomach disturbance. The pain is clearly related to food the intensity often modified by the kind and quantity taken. Food ceases for a time, the pain returning from two to four hours later. Hot drinks, soda, and irrigation will relieve. Spasm of the diaphragm is seldom seen except in some cases of perforation. The chronic gall-stone case with impacted stone ulceration, and adhesions in which no jaundice appears and the stomach symptoms such as gas vomiting burning distress, sour eructation impaired appetite and dilatation predominate and the pain is moderate and follows food will too often be diagnosed as ulcer while the duodenal case in whose early history we can elicit only irregular attacks of sudden sharp pain of peritonitis or acute spasm (and with no history of hyperacidity) who do not have gas vomiting, or sour eructation, will as surely be mistaken for gall-stones. To the concert of surgery we shall too often be obliged to leave the differentiation of these class of cases and their comprehensiveness the surety of relief.

Concerning the symptomatology of ulcer of the stomach proper Dr. Robert (86) makes a very clear statement. He says:

The typical ulcer pain develops from half an hour to two hours after eating and develops gradually is burning boring cutting or stabbing is localized in the middle line, close to the ensiform cartilage possibly radiating to the back of the precordium is regular in occurrence and is induced principally by solid foods, and rarely by water it lasts for some time and is often terminated only by vomiting ingestion of alkalis or albuminous foods. The tenderness is pronounced and is sharply localized over a small area in the middle line between the ensiform cartilage and a point midway down to the umbilicus. Vomiting is not at all essential to the clinical picture. Actual hæmatemesis, taken with these symptoms is almost absolutely diagnostic. Hyperchlorhydria is not rarely found. It is contributory evidence but it does not rule out carcinoma. In gastric ulcer hypersecretion

is even a more constant finding than hyperchlorhydria.

Einhorn's (91) string test and his silk gauze rubber-covered bag test and Meunier's (93) acetic acid test and his eructation test (95) are all very ingenious but are probably not very valuable additions to our means of diagnosis of gastric and duodenal ulcer as observation at the operating table and the perfection of X ray examination have given such definite information concerning the meaning of many of the phenomena which have been observed that a number of the more complicated methods devised by the internists before the days of surgical and roentgenological demonstration are now unnecessary.

Eusterman speaking from the wide experience of the Mayo Clinic has probably given the best analysis of the various means of clinical diagnosis that has yet been given. An abstract of Eusterman's (108) findings therefore would seem appropriate in a paper of this character.

Eusterman (108) analyzes 1078 cases of operatively demonstrated ulcers treated during the years 1913-14 at the Mayo Clinic with the following named results in regard to diagnosis. Of the number stated 264 were gastric in 50 per cent of the gastric cases the course was intermittent, free intervals alternating with spells of variable duration regular 40 per cent, irregular 49.5 per cent in frequency. In 50 per cent the complaint was continuous and progressive over periods of from several months to several years prior to operation. Pain appeared within four hours after meals in 83 per cent 55 per cent within three hours 30 per cent within two hours was constant in 38 per cent definite nocturnal pain 2 per cent pain was controlled by food or alkalies or both in nearly 70 per cent of the 70 per cent 84 per cent showed relief after food while alkalies alone gave relief in 15.6 per cent history of bleeding in 20 per cent, and of this number 41 per cent had hæmatemesis alone, 15 per cent melæna and 44 per cent both melæna and hæmatemesis gastric analysis showed altered blood in 38 per cent of the cases examined, gastric retention in 13.3 per cent average total acidity 54 average hydrochloric acid 52 in 18 per cent acid below normal absence of free hydrochloric acid in 13 cases.

Eusterman remarking on these 13 cases says:

Under such a circumstance the possibility of carcinoma syphilis, or associated disease was evident. Of these patients 5 have since died of malignancy and 3 now apparently show malignancy. In the others the advanced age asso-

ciated with considerable fresh blood in the extract, gall bladder disease or other pathological lesion, explains the achlorhydria.

He found the generally accepted ulcer complex present in 81 per cent irregular but suggestive in 16.8 per cent irregular in 3.5 per cent. In the remaining 7 per cent the picture was atypical or the record was incomplete.

Concerning the correctness of the clinical diagnosis at the Mayo Clinic Eusterman says that of the 264 cases a primary correct diagnosis of gastric ulcer was made in 66 per cent of cases, an alternative diagnosis in 8 per cent duodenal ulcer was the primary diagnosis in 2, per cent of the gastric ulcers the roentgen ray gave definite assistance in 65 per cent of the cases examined. Concerning the duodenal ulcers he found that the clinical course was intermittent in 95 per cent of all cases periodic in 50 per cent continuous pre-operative complaint of variable duration was noted in 26 per cent in 85 per cent the pain appeared in 2 to 5 hours after taking food in 15 per cent within two hours nocturnal pain 7 per cent definite food relief 67 per cent partial relief 15 per cent relief by alkalies 39 per cent hæmorrhage 25 per cent classed melæna 8.8 per cent hæmatemesis 6 per cent both melæna and hæmatemesis 10.5 per cent the acid values averaged 20 per cent higher than in gastric ulcers and in only 7 per cent were they below the accepted standard concerning the accuracy of diagnosis of duodenal ulcer in 66.7 per cent a primary clinical diagnosis was made in 8 per cent an alternative diagnosis in 10.8 per cent a diagnosis of gastric ulcer was made. Of 251 cases in which the tentative diagnosis of gall bladder disease was also made 20 per cent showed the disease present and 22.3 per cent were shown to be chronic perforating duodenal ulcers. Of the entire series the ulcer complex was fairly regular in 71 per cent suggestive in 7.2 per cent irregular in 13.2 per cent.

X RAY DIAGNOSIS

According to Crane (115) the credit of first using bismuth in examination of the stomach is due Williams and Cannon of Boston who in 1899 five years before Reder's publication, mixed bismuth in a large quantity in bread and milk, and conducted the stomach examination in human subjects by screen and plates in both the upright and horizontal positions, very much as we do today. To Haudek of Vienna however is due credit for much of the fundamental work of X ray examination of the gastro-intestinal tract.

During the last two or three years, however Gregory Cole of New York, George of Boston, Carman of Rochester and Case of Battle Creek, have advanced the work in connection with roentgenologic examination of ulcer of the stomach and duodenum so much that the excellent early work of Flaudek may almost be said to be obsolete. So rapid has been the advancement that roentgenology is at least a very close second to the clinical history in importance as a diagnostic agent.

Until recently the roentgen diagnosis of ulcer has been made by symptom-complexes, which have been well expressed by Carman (100) Carman gives the following named radiologic evidences of gastric ulcer

- 1 Diverticulum of perforating ulcer
- 2 Visualization of bismuth filled crater of a callos ulcer
- 3 The incisura, or transverse contracture indenting the greater curvature
- 4 Localized pressure tender point on lesser curvature.
- 5 Residue after six hours
- 6 Acute fish hook form of the stomach, with displacement to the left and down.
- 7 Delayed opening of the pylorus.
- 8 The settling of the bismuth to the lower pole of the stomach such as is seen in hypotonicity or atony

Carman also gives the radiologic evidence of a duodenal ulcer as follows

- 1 Early free opening of the pylorus with early clearing of the stomach.
- 2 Lagging of bismuth in the duodenum
- 3 Residue in the stomach after six hours.
- 4 Pressure tender point over the duodenum
- 5 Dilatation of the cap
- 6 Irregular outline of the cap or duodenum.
- 7 Diverticulum of a perforating ulcer
- 8 Vigorous peristalsis, especially if there is obstruction.

During the last year Carman (121) says that he has been convinced that serial radiography has been a decided factor of his correct diagnosis during the past year

To Cole (113) is probably due the chief credit of perfecting serial roentgenography. He contends that in case of duodenal ulcer if one plate in forty shows a normal duodenum a negative diagnosis may be made with certainty. He further says that by studying individually and collectively a large series of roentgenograms, and matching them over each other one can make an early diagnosis of carcinoma on the pars pylorica,

indurated ulcer of the stomach and duodenal ulcer with a degree of certainty equal to that by which one recognizes renal calculi by roentgenograms.

George (46) speaks of serial X ray plates as the positive or exact method of roentgen diagnosis of duodenal ulcer and says that the method depends on adequate demonstration on plates of the anatomical condition of the duodenum. This is opposed to the diagnosis by symptom-complexes of increased gastric peristalsis, hypermotility gastric stasis, relaxed pylorus, etc. These complexes are only inferential in the evidence, never positive. George agrees with Germain and Cole that the first portion of the duodenum is always constant in shape, contour and general characteristics, unless actually diseased. If the first portion of the duodenum is normal it can be demonstrated by the bismuth method by using some one of the three positions prone standing or lateral. He says there is no exception. The apparent exceptions are due to improper technique. The demonstration of a normal duodenal cap upon a plate definitely rules out the possibility of surgical duodenal ulcer. On the other hand, the constant presence upon a series of plates of a defect or abnormality in the cap means positively a pathological condition in the duodenum. This pathology may be an indurated ulcer adhesions, gall bladder disease spasms, etc. which require a differential diagnosis. This deformity he says, is not caused by minute mucosal defect — but by a much larger callus, which involves the submucosal and muscular coats.

George and Gerber (106) claim to have made exact diagnosis of duodenal ulcer in 78 out of 83 cases operated upon. In three cases duodenal ulcer was reported, but there were minor errors in diagnosis. In one case there was complete failure of diagnosis. Of 150 patients operated upon in which a negative roentgen diagnosis was made duodenal ulcer was not found in any case. In one necropsy a duodenal ulcer was found in which the previous report had been negative.

Combining all of the means of clinical diagnosis with roentgenography it seems possible now to make a correct diagnosis in 90 per cent or more of gastric and duodenal ulcers, which is truly a remarkable achievement.

THE RELATION OF GASTRIC AND DUODENAL ULCER TO CANCER

Rodman (161) who was the first to recommend the systematic removal of the ulcer bearing area or pyloric end of the stomach and duodenum, on the ground that 75 per cent of the ulcers were

found in this area gave as his principal reason for such radical removal the fact that cancer so frequently developed on an ulcer base.

This question, like most others, has had its undulations.

Cheney (169) in a very exhaustive article in which the literature is extensively reviewed gives the chronological development of the idea of the relation of cancer to ulcer as shown in the Mayo Clinic

Graham, writing in 1906 said it had been possible to demonstrate in 1903 that 15 per cent of gastric cancers had an ulcer base. In 1904 the percentage rose to 18. In 1905 it reached 47 to 49 per cent. Writing again in 1908 Graham was able to show that 60 per cent of all patients operated upon for cancer gave a precancerous or non-malignant cancerous history. In 1909 Wilson and MacCarty announced that 71 per cent of gastric carcinoma showed sufficient gross and microscopical evidence of ulcer to warrant labeling them cancer developing on previous ulcer.

Under the pathological leadership of L. B. Wilson the Mayo Clinic with more operative material than any other clinic in the world has taken a very radical and advanced stand in favor of the frequent transition of ulcer into cancer. We can probably do no better than to quote the conclusions of the pathologists.

Wilson and MacCarty (163) after studying most of the cancers that had been removed at the Mayo Clinic, give the various steps in the transition of ulcer to carcinoma in the following sequence

- 1 Chronic ulcers, from the center of which the mucosa has disappeared leaving a scar tissue base.

- 2 In the overhanging border of the ulcer the mucosa is proliferating

- 3 Deep in the borders groups of epithelial cells have been nipped off by scar tissue and are exhibiting all stages of aberrant proliferation with infiltration of the surrounding tissue.

- 4 Metastases are forming in the lymphatics of the stomach wall and adnexa. In a small number of the patients operated upon the condition is too far advanced to show these steps, and a very small percentage probably not over 2 per cent, give evidence of rapid aberrant epithelial proliferation and infiltration without any previous signs of ulcer. A lopting Adams's classification most gastric carcinomata are designated as blastomata, originating from the unipotent cells of postnatal displacement although it is probable that a very small number are blastomata originating from unipotent cells that assume neo-

plastic character without displacement and rapidly assume malignancy

Five years later Wilson and McDowell (167) reporting on 399 cases of gastric cancer from which the tissue containing the primary lesion was resected in the Mayo Clinic, found that 48 per cent showed doubtful cancer in the border of the affected tissue 15.8 per cent showed ulcer with positive early cancer in the border of the lesion only 36.8 per cent showed ulcer with advanced cancer 42.6 per cent showed a cancer in which the previous ulcer was doubtful. Of 46 cases of gastric cancer from which the tissue containing the lesion was obtained at necropsy one case showed ulcer with doubtful cancer 2.2 per cent seven cases 15 per cent, showed ulcer with advanced cancer while in 38 cases, 82 per cent, the evidence of ulcer previous to cancer was doubtful.

This difference between cancers removed at autopsy and those removed by surgical means is presumably set forth by the authors for the purpose of showing that as the cancer advances the distinct evidences of the pre-existing ulcer disappears.

Wilson and McDowell in closing this article say

It seems probable from the clinical and pathologic evidence of this series of cases that gastric cancer rarely develops except at the site of a previous ulcerative lesion of the mucosa.

This radical statement, although coming from the Mayo Clinic, has not been left unchallenged and there is very strong argument on the other side of the question.

Lockwood (139) claims that in 174 cases coming under his personal care, in which the history was complete 147 patients gave absolutely no history of previous indigestion 14 gave either a history of alcoholic excesses and morning vomiting or indefinite dyspepsia that was practically negligible while only 13 gave a history that might point toward gastric ulcer so that in but 7 per cent could such a surmise be entertained. A positive history of ulcer was obtained in but 3 per cent of cases.

On the other hand Pavr (163) found that 25 per cent of resected callous ulcers showed malignancy while Kuttner (164) examined specimens from 30 resected callous ulcers and found microscopic evidence of cancer in over 43 per cent. In a later paper Kuttner (170) reporting on 1200 stomach cases treated in seven years prior to 1914, two-thirds of which were cancer of the stomach found that in but 15 per cent of the cancer cases had there been preceding stomach

trouble of any kind and of this 15 per cent he was unable to determine whether they were ulcer gastritis, or achylia.

It seems that there is a heavy burden of proof on the advocates of the theory that cancer usually develops on an ulcer base to show that the precancerous ulcer was not really cancer from the start for the statistics of the a large clinic in which there are almost as many cases of cancer of the stomach as of ulcer tend to prove that a very small per cent of the ulcers treated by gastro-enterostomy ever become malignant even in the hands of those who never make simple ulcers.

Notable in this group of surgeons are Patterson and Kocher who have found that malignant degeneration occurs in less than 3 per cent of gastro-enterostomies for supposed simple ulcer.

Kuttner (101) in 120 operatively demonstrated cases of ulcer found that cancer developed in only 2 cases after operation.

Petren (172) after following up 35 patients operated upon for ulcer found that malignant disease had followed in 5.5 per cent of the cases.

Gressot (165) studied 114 recent articles on gastric ulcer and cancer and concluded that malignant degeneration of surgical ulcers occurs in only 2.3 per cent of all cases after gastro-enterostomy while it is liable to occur also after resection of the stomach. He believes that gastro-enterostomy actually has an inhibiting influence on malignant degeneration which might otherwise occur. His compilation confirms the greater tendency to malignant degeneration of ulcers located at a distance from the pylorus, and of those with a tendency to bore deep and grow hard.

Billeter (166) reporting on the present condition of 116 patients out of 125 given operative treatment for gastric ulcer in the 13 years prior to 1910, states that cancer has developed during all these years in only one patient.

Von Eiselsberg (129) in analyzing 334 cases of gastro-enterostomy for ulcer of the stomach and duodenum treated in ten years, found that 41 of the patients had died at a later period after having recovered from the operation. Of the 41 the cause of death was known in only 23 as follows: Cancer of the stomach 13 extension of the ulceration 6 tuberculosis of the lungs 3 new growth of the kidney 1.

A. J. Ochsner (168) expresses a novel view of the relationship between gastric ulcer and cancer. In the first place it may be said that he believes in the parasitic origin of cancer. Concerning cancer of the stomach he believes that the cancer cell is ingested with uncooked vegetables, from

manure, and finds lodgment in the broken surface of a gastric ulcer. He says that cancer does not develop in duodenal ulcer because food is not retained in contact with an ulcer of the duodenum long enough to effect a lodgment.

While the most definite and rational theory as to the causation of cancer is that it is preceded by trauma or chronic irritation, and while this theory could be applied ideally to the relation between gastric ulcer and cancer from a theoretical standpoint at least there is certainly a great deal of clinical evidence lacking.

Sears, in *Northwest Medicine* February 1916 in a paper in which he critically analyzes the history of 145 consecutive cancer cases, states the case very tersely.

A definite relation existing between preceding diseases of the stomach and cancer has not yet been proven but that a close etiologic relation exists has been shown to be very probable. While 40 per cent of our cases gave a history of a precancerous gastric disease and about 80 per cent of these could have been ulcer clinical methods do not suffice to prove an etiologic relation though they furnish strong presumptive evidence. It requires most careful and unprejudiced analytical history taken with this very point in view to be of an value.

MODUS OPERANDI OF CURE OF ULCER BY GASTRO-ENTEROSTOMY

That the great majority of ulcers of the stomach and duodenum are symptomatically cured as the result of a posterior gastro-enterostomy there can be no doubt for during the past fifteen years a great many thousands of operations of this kind have been performed for ulcer. Just how the cure is brought about is a question still under discussion. That relief of pyloric spasm by some means is the cause of the relief of pain is believed by a very large number of surgeons beginning with Doyen who may indeed be said to be the father of gastro-enterostomy for ulcer of the stomach.

Neudorfer (110) Berg (156) and Brun (158) all believe that the relief of symptoms is due more to the relief of the pyloric spasm than to the healing of the ulcer.

We have had the opportunity in doing the two-stage operation for ulcer in at least a half dozen instances of seeing a very angry indurated ulcer almost entirely disappear within three weeks after the gastro-enterostomy. A very decided influence has been exercised by something on the ulcer. Is the relief produced by reducing the acidity of the stomach contents which come

in contact with the ulcer or by allowing the easy emptying of the stomach and reducing the spasm in that way? In other words is the problem a mechanical or a chemical one?

There is certainly a great deal of evidence that it is both mechanical and chemical. Admitting this and admitting the correctness of Paterson's statement that the average reduction of acidity after gastro-enterostomy is 30 per cent the next question is, how is the reduction brought about. Is it due to the inflow of bile into the stomach or to the more rapid emptying of the acid stomach contents? At first thought it seems that it would make little or no difference as to how the reduction in acidity might be brought about. On second thought, however there is a difference for if it is simply a question of letting bile into the stomach in accordance with a theory that the contact of bile which dilutes the gastric juice heals or relieves the ulcer by reducing the acidity not only is there no need for obstructing the pylorus artificially after a gastro-enterostomy but it is even highly desirable that the pylorus be allowed to remain open while on the other hand if the operation is purely for drainage obstruction would be highly desirable in duodenal ulcers, in that it would keep the acid contents from coming in contact with the ulcer at all.

It is conceded by all that the greater the obstruction of the pylorus at the time of operation the better and surer the results will be. This fact has led to a great many methods of artificially obstructing the pylorus, but I think that all who have compared several cases in which permanent obstruction was tried with an equal number of unobstructed cases, will agree that the unobstructed cases do quite as well as the obstructed ones, if not better. Here again, it seems quite probable that the reduction in acidity is brought about both by more rapid emptying and by the inflow of bile into the stomach thus diluting its contents, just as withdrawing the blood of a patient who has been asphyxiated with illuminating gas, accompanied with an infusion of an equal amount of fresh blood into the vessels of the patient produces much better results than either the method of drawing off of the asphyxiated blood or the simple infusion of a certain amount of fresh blood employed alone.

Assuming that the reduction of the acidity of the stomach contents is due to such a double process we can harmonize our clinical results in a much better way. The Mayos Peck, Doven and, in fact, the majority of the surgeons of wide experience are inclined to lay more stress on the drainage feature. There are two or three things

however which throw some doubt on their assertions. In the first place the Finney operation when done for gastric ulcer apparently gives just as good, if not better results than posterior gastro-enterostomy. Secondly we must consider very seriously the work of Paterson (79) which is very painstaking and bears the earmarks of splendid scientific work. Paterson takes the ground that the mechanical feature is unimportant and that the good results are brought about by the influx of bile. His experience is that in cases in which there is no organic stenosis of the pylorus the evacuation is slightly accelerated. Usually the stomach is empty in from three to four hours after meals. He tests this out by the amount of food recovered an hour after a test meal. In 60 per cent of a series of investigated cases the amount recovered after a test meal was less after operation than before but the difference is not great. On the other hand in 66 cases the amount of food recovered an hour after meals was 160 ccm and 180 ccm after operation. He concludes that in cases where the gastric motility was impaired marked by pyloric stenosis or by adhesions gastrojejunostomy results in marked improvement of evacuation of stomach contents. Paterson thinks it is immaterial whether the food leaves the stomach by the pylorus or by the stomach. He asks the question. How does the mechanical explanation of gastrojejunostomy explain the relief of pain in the case of gastric ulcer in the stomach on the lesser curvature or in the body? Paterson contends that the results of gastro-enterostomy in this class of cases are equally as good as those in gastro-enterostomy for pyloric ulcer. He says. The most striking effect of gastrojejunostomy on the gastric contents is the diminution of the total acidity 30 per cent. He contends that this diminution is due to two causes. To diminution of the total chloride secreted by the gastric mucosa and to neutralization of free hydrochloric acid by bile and pancreatic juice which gain entrance to the stomach through the anastomotic opening. In 99 per cent of Paterson's cases there was an increase of mineral chloride which gained entrance with the bile through the anastomosis. He has had occasion to undo several of his gastro-enterostomies with always the same result namely an increase in the mineral chloride after gastro-jejunostomy and a decrease toward the normal after the restoration of the alimentary canal to its normal condition. Furthermore in all cases of gastro-enterostomy accompanied by entero-anastomosis, for the purpose of short-circuiting the bile

the chloides have diminished. The bile and pancreatic juice contains 0.4 per cent of mineral chloride. By this means, it is estimated by Paterson that the average gastric contents after gastrojejunostomy contain between 10 and 15 per cent of bile and pancreatic juice. The average amount of bile in the normal stomach is between 5 and 10 per cent. The average increase of mineral chlorides after gastro-enterostomy by the various methods are

Posterior (Mayo) 0.052

Posterior (isoperistaltic) 0.096

Posterior (vertical) 0.087

Anterior (transmesocolic) 0.080

Anterior (long loop) 0.070

Sippy, in harmony with his alkalizing medical treatments, believes with Paterson that the chief function of gastro-enterostomy is the alkalization of the stomach contents by the bile and pancreatic juice.

GASTROJEJUNAL ULCERS

Moynihan (213) in volume 1 of the third edition of his book, "Abdominal Operations," speaks of gastrojejunal ulcer as "the only serious complication to be faced in connection with the operation of gastro-enterostomy the vicious circle of twelve or fourteen years ago having practically disappeared with the perfection of the technique."

At the 1916 meeting of the Southern Surgical and Gynecological Association the question came up in the discussion of the cause of gastrojejunal ulcer as to the statement of W. J. Mayo (200) that in 1141 gastrojejunostomies done by them up to December 1909 only three gastrojejunal or pseudojejunal ulcers had been encountered although at least the peritoneal suture in all of their cases up to that time had been of non-absorbable material. C. H. Mayo who was present at the discussion stated that undoubtedly there were more secondary ulcers than that in the number but that they had not been diagnosed. It is certainly true that there are a great many more gastrojejunal ulcers coming to our attention now than in former years.

Rowlands (40) looking up the statistics fully concludes that gastrojejunal ulcers follow gastro-enterostomies in about 1.5 per cent of cases.

Less than 2 per cent of von Eiselsberg's simple gastrojejunostomies developed secondary ulcers, in ten years experience.

The writer's own work shows a total of 1.2 per cent of secondary ulcers after simple gastro-enterostomy.

VanRoogen according to Moynihan, collected the details of 613 cases of gastro-enterostomy in

which 10 cases of gastrojejunal ulcer had occurred. Of these there were 189 cases of anterior gastro-enterostomy with 6 cases of secondary gastrojejunal ulcer 3.2 per cent. There were 444 cases of posterior gastro-enterostomy with only 4 cases of gastrojejunal ulcer 0.9 per cent. This relatively greater frequency of gastrojejunal ulcer following anterior gastro-enterostomy as compared with posterior gastro-enterostomy is apparently borne out by all of the available literature.

An interesting feature of this question is that posterior gastro-enterostomy with unilateral exclusion of von Eiselsberg seems to be particularly prone to development of ulcers for we find that of von Eiselsberg's 334 cases of simple gastro-enterostomy in only 4 did gastrojejunal ulcer develop while in 36 cases in which the gastro-enterostomy was combined with unilateral exclusion 3.83 per cent, developed secondary ulcers.

In 83 simple posterior gastro-enterostomies in the writer's practice only one developed a gastrojejunal ulcer while in 22 operations in which gastro-enterostomy was combined with unilateral exclusion two developed secondary ulcers which after being excised returned the second time in both instances.

W. J. Mayo (200) speaking of gastrojejunal ulcer says "In all of these cases that were explored the buried or partially buried remains of the non-absorbable suture material used in making the anastomosis was found. The true importance of this was not appreciated until it was seen in a series of cases. Further on in his paper Mayo says 'Jejunal ulcers are usually mechanically produced by retention of the suture material used in making the anastomosis.'

C. H. Mayo at the 1916 meeting of the Southern Surgical and Gynecological Association stated that about four out of five cases seen had remnants of the non-absorbable suture material hanging in the ulcer that recently they had seen cases of secondary ulcer in which nothing but catgut had been used.

Moynihan, in discussing the cause, says "It may be the smallness of the opening, a bruising of the edges of the anastomosis, or the development of a hematoma in the wall of either viscus as the result of the wounding by a needle, persistent presence of quantities of free hydrochloric acid, or the tearing and unceasing irritation of unabsorbable thread, which has only partly been released from the suture line. It is the outer stitch which probably perforates here and there through the mucosa which is found hanging at the suture line months after the operation."

Moynihan, however is inclined to think that the secondary ulcer is due to the same cause which produced the primary ulcer which he believes to be most likely a focal infection — usually in the abdomen, and particularly the appendix, which he believes should be removed at every operation for gastroduodenal ulcer. Moynihan (213) divides these ulcers into four clinical types

1 Ulcer develops rapidly and perforates shortly after operation. There are only four cases recorded of this type.

2 The ulcer develops within a few weeks or months of the operation and the symptoms suggest a recurrence of the ulcer for which the operation was performed or a stenosis of the new opening. The symptoms are very similar to those caused by the original ulcer.

3 The ulcer develops slowly and insidiously and undergoes subacute perforation with the result that a tumor forms in or abutting upon the epigastrium. About two-fifths of all recorded examples fall in this category. Upon examination of the patient a distinct tumor is felt. As a rule only some trivial discomfort or indigestion after meals is noticed. When the abdomen is opened the jejunum at or near the anastomosis is usually found adherent to the parietes. Upon separating the viscera a perforation into the intestine at the site of the ulcer a little below the site of anastomosis is discovered.

4. The ulcer perforates into a hollow viscus. The ulcer is of the chronic type and the perforation occurs after adhesion to a hollow viscus, either the stomach or colon.

Both C. H. and W. J. Mayo have repeatedly made the statement that they have never seen a true jejunal ulcer in all of their work. This has been entirely true in my own practice. The picture given in Class 3 by Moynihan has been true in all of my cases, except that the ulcer has been in the stomach distal to the anastomosis, and of large size. The perforation has been extensive, but has been walled off in every instance by the transverse mesocolon making a considerable palpable tumor. In this connection it is well to state that I have seen one true jejunal ulcer which was exhibited to the County and City Medical Society of Portland several years ago by W. B. Holden. The ulcer was exactly opposite the anastomotic opening.

In giving the symptoms of gastrojejunal ulcer we can probably do no better than to give the words of Rowlands (50)

Symptoms usually appear after a period of comparatively good health. The first thing complained of is indigestion, the symptoms simulating

those of duodenal ulcer except that the pain which the patient describes as burning is usually situated a little to the left of the middle line, above the umbilicus. Further the relation of the pain to food taking is far less striking although it is usually aggravated by solid foods so that the patient limits his diet mainly to liquids and soft foods. Sometimes the pain is relieved by food but it usually comes on again in an hour or two. Usually there are nausea and loss of appetite, occasionally vomiting and even hæmatemesis with signs of dilatation of the stomach. There is often tenderness and rigidity to the left of the umbilicus and there may be induration here due to plastic peritonitis with adhesions to the parietes, and even a cutaneous fistula may form. At any time signs of perforative peritonitis may develop. The patient may have been perfectly well following the operation and the first sign of trouble is very acute pain in the abdomen, with rapid development of signs of perforative peritonitis.

Carman and Balfour (118) have made interesting roentgenologic studies of 41 patients. Of these, 10 showed abnormalities not generally seen in gastro-enterostomized stomachs. The signs were retention from a six hour meal, large size of stomach, graduated peristalsis and spasticity, deformities of the contour about the stomach, deficient patency of the stomach, local irregularity of the contour and dilatation of the jejunum. The most direct index was deformity of the stomach.

Rowlands advises that medical treatment consists mainly of rest in bed, feeding of albuminous foods, and the neutralizing of the gastric juice with alkalis. In the way of surgical treatment he recommends Finney's operation, presumably for letting the bile into the pyloric end. He recommends as a more radical procedure the severing of the old anastomosis and the making of a new one.

C. H. Mayo opens the loop of the bowel and enlarges the anastomotic opening by the Finney type of operation and removes the thread. He says: Eventually a spontaneous cure may follow the removal of the suture in some cases.

In my own experience the surgical treatment of these ulcers is very discouraging. In my first two cases the secondary ulcer was excised and in both instances the ulcer recurred in exactly the same location the second time. One of the patients died following the third operation in which I attempted to remove the ulcer, close up the old anastomosis and make a new one. The

other patient was operated upon twice more by Mayo in Rochester and I believe is not entirely well yet. It may be stated that both of these cases were the ones referred to as following the von Eiselsberg unilateral exclusion, and are reported in this issue of SURGERY, GYNECOLOGY and OBSTETRICS. My third case was one following ten months after a posterior gastro-enterostomy and it had perforated so that the secondary operation required drainage. The patient who had chronic nephritis, died two days after the operation with complete anuria. My fourth case was one in which the secondary ulcer followed a sleeve resection for hour glass. The patient died thirty days after primary operation from a sudden hemorrhage coming from the base of a large secondary ulcer discovered post mortem.

Von Eiselsberg (140) reports 15 operations for postoperative peptic ulcer. Of these only one was reported as permanently cured, 4 improved, 3 lost sight of, 2 unrelieved, 5 died.

Taking into consideration all of the available literature on the subject of secondary peptic ulcers we are forced to conclude that this is one of the most serious conditions with which the surgeon has to deal and it is very questionable whether our learning to make a diagnosis of this condition is of very much advantage to the patient from a surgical standpoint. It has been of advantage however in teaching us the importance of one of the most serious phases connected with an operation for gastric and duodenal ulcer. In fact if we are to believe statistics that are coming forward gastrojejunal ulcer is almost as serious a desideratum as the primary mortality of operation. It is fortunate that it apparently follows simple posterior gastro-enterostomy less frequently than any other operation for gastric and duodenal ulcer for this is the operation which has given the best results.

C. H. Mayo has for the past two years used only tannin catgut in making a gastro-enterostomy. He believes that this will lessen the danger of gastrojejunal ulcer but admits that it may occur when only catgut is used.

Taking into consideration the fact that these patients got along fairly well before we learned to make the diagnosis, it seems that owing to the seriousness of surgical intervention for secondary ulcer and the poor prospect of cure, even if the patient recovers from operation, it is best to treat these patients according to Sippy's (78) plan and advise against operation, except in extraordinary cases.

END-RESULT

Discussing the question of end results following medical treatment we find that the statistics in regard to the cure by the European internist are entirely worthless as far as results are concerned. Lockwood (130) throws a good deal of light on these statistics in analyzing the statistics of von Leube. June 3, 1909, von Leube gave a report in the *Deutsche medizinische Wochenschrift* of 627 patients treated in his clinic during the eleven years intervening between 1897 and 1909. Of these cases with and without hemorrhage, 566 or 90 per cent were clinically cured (60 per cent within four weeks, 15 per cent within a longer period), 85 per cent were improved, 1 per cent remained unimproved, 0.3 per cent died as a result of hemorrhage. Tabulating the ulcers that were attended by hemorrhage, he found that 90 per cent were clinically cured, 6 per cent within five weeks and 5 per cent within a longer period; 65 per cent were improved, 1.25 per cent remained unimproved and 1.25 per cent died. The most illuminating part of von Leube's statistics however is his definition of clinically cured. According to Lockwood von Leube states in his communication that he regards as cured those patients in whom the symptoms disappear for a period of three weeks, and by whom ordinary hospital diet, not especially prescribed for gastric diseases, but given to those patients whose digestion was good, was eaten without discomfort. The one saving clause is to the effect that von Leube admits that occasionally an ulcer is only apparently cured and that after a longer or shorter time pain, dyspepsia, and hemorrhage may reappear. If he had substituted the word usually for occasionally in this sentence his statistics would have been perfectly accurate. Every surgeon can testify that practically all of his patients have undergone numerous clinical cures of the kind referred to by von Leube. Mayo's jocular requirement of seven medical cures before an operation should be thought of is exceedingly modest, and understates the case for as shown in all of our statistics, the average ulcer patient is treated surgically after nine and one half years of medical treatment. The average patient gives a history of having been "cured" about twice a year and I use the term "cured" advisedly taking von Leube's definition of a clinical cure as the standard.

In the same article Lockwood quotes Greenough and Joslin's report of the work at the Massachusetts General Hospital in which they state that while 82 per cent of patients with ulcer

were discharged as cured or relieved only 40 per cent remained well. He also quotes Mumford and Howe, who estimate that there are 80 per cent of apparent cures of which one-half relapse and also quotes Paterson who found that in 72 hospital patients discharged as cured but 19 remained well, were doubtful 40 were still suffering 5 had undergone surgical treatment and one had died.

It is probable that the average of medical cures of gastric and duodenal ulcer in the hands of conservative and reliable internists is approximately 50 per cent. Practically all of the surgeon's work comes from the other 50 per cent. It is undoubtedly true, however, that many of the improved as well as the unimproved cases were not ulcers at all for every surgeon can testify to the frequent mistakes of the most profound internist as well as himself.

Moynihan (102) in an address before the British Medical Association in 1913 says:

There is now no longer any doubt in my own mind that the commonest site of gastric ulcer is in the right iliac fossa. That is to say that in the majority of cases in which the most erudite teaching of the most astute German physicians would justify or compel a diagnosis of ulcer the patient is often suffering from a lesion elsewhere and more often than not in the appendix.

It is certainly true that the internist who never follows his cases to the operating room where he might prove or disprove his diagnosis is a very untrustworthy diagnostician so far as ulcer is concerned and his statistics of cure are just as untrustworthy for he establishes in his own mind a certain symptom-complex which means to him ulcer but which often is very far from it.

There was a time when the surgeon was making statistics on this basis for when he opened a case he had diagnosed ulcer from the symptoms and failed to find tangible evidences of the ulcer he assumed that ulcer existed and did a gastro-enterostomy. But a just retribution soon overtook him for practically all of these cases in which he did a gastro-enterostomy without the presence of an ulcer were very much worse off after the operation than before this caused gastric surgery rapidly to come into disrepute, until at the present time no self respecting surgeon will do a gastro-enterostomy for an ulcer that he can not absolutely demonstrate to his own entire satisfaction, as well as to the satisfaction of the bystander. Therefore the cases that the surgeon of standing reports now as ulcers are ulcers with out doubt, and most of the ulcers coming to the surgeon represent so many medical failures.

But, after all it is with a spirit of deep humility that the surgeon discusses end results of the surgical treatment of ulcer for these are by no means so good as we would like to have them and like the internists' statistics, the surgeons are also very inaccurate and variable.

Deaver (102) includes 897 cases treated by Mayo Moynihan Robson Czerny Deaver Paterson, Helfenich in a table in which the average of cures was placed at 86 per cent. In Deaver's own patients who were carefully traced only 58 per cent had no gastric symptoms after operation 14 per cent were markedly improved 6 per cent were unimproved while 14 had died either from the original gastric lesion or from a late complication or from cancer.

Lockwood (139) quotes the statistics of Bettman and White, who found that of 126 patients who survived operation and who were under observation for a year or more only 64.3 per cent remained well 63 per cent were much better while 41 per cent were reported as little or no better.

Bidwell (103) reports 70 per cent cured.

Bourne (105) traced 68 cases following gastro-enterostomy and found that only 38 per cent of the gastric ulcers could be called complete cures while the duodenal ulcers gave 70 per cent of cures.

Graham (138) traced 337 duodenal ulcers, found 70 per cent were entirely cured 16 per cent much improved 11 per cent fair 3 per cent not improved. Of those ulcers extending to or involving the pylorus, 72 per cent were cured 24 per cent much improved 3 per cent fair 1 per cent unimproved. Of 162 cases of gastric ulcer which were traced 59 per cent were cured 22 per cent much improved 13 per cent fair 7 per cent unimproved.

Joslin (40) traced 70 cases of gastric and duodenal ulcer treated surgically. Of these 47 per cent were well 19 per cent relieved 14 per cent unrelieved 20 per cent had died since recovering from the operation. Joslin's combined results of medical and surgical treatment of 236 cases of gastric and duodenal ulcer during a period of 16 years are well 39 per cent relieved, 32 per cent unrelieved 12 per cent dead 16 per cent. Of the cases 6 per cent had up to the time of the report died of cancer.

Von Eselsberg (140) of 317 cases recovering from operation was able to trace 134 which had been completely cured.

Peck (130) tracing 58 cases operated upon at the Roosevelt Hospital, found that 88 per cent showed good results.

Finney and Friedenwald (43) in 2 cases of gastro-enterostomy traced for more than a year showed 77.2 per cent of satisfactory recoveries, and in the pyloroplasty group of 82 cases 88.6 per cent.

Kuttner (170) found that 65 per cent of the cases were completely cured and in 20 per cent there was marked improvement.

In other works the results were fairly satisfactory in about 85 per cent which corresponds closely to the statistics of the Mayo Clinic reported by Graham (18) just quoted for counting the cured and the much improved cases of duodenal ulcer 80 per cent of the cases were satisfactory while the gastric ulcers had 50 per cent satisfactory result so after all the ultimate statistics of the leading surgeons of the country are quite uniform the absolute cures varying from 50 to 80 per cent while the satisfactory improvements rang from 50 to 100 per cent.

W. J. Mayo (218) discusses the meaning of the term cured. The patient who seeks relief from distressing symptoms cannot always appreciate a practical cure. The cure is relative and depends on various conditions: (1) general nervous stability, (2) the pathological condition present, (3) the extent of the condition, (4) the proximity of the lesion to vital tissues, (5) extent of operation necessary to remove the diseased tissue, (6) concomitant diseases, (7) the patient's power to react. These factors enter into consideration when treatment especially surgical is to be instituted. The patient may be and often is, freed from disease and life prolonged yet he may not be freed from symptoms quite distressing. This is not always the fault of treatment but an inevitable result of the pathological condition occurring before treatment was undertaken.

TECHNIQUE OF MEDICAL TREATMENT

A. Schmidt (173) lays particular stress on the importance of keeping the patient in bed in the treatment of gastric ulcer believing that the recumbent posture relieves the stomach from traction and pressure of other organs, rests the greater curvature, and lifts the anterior stomach wall out of the stomach contents. He applies moist heat, but suspends application of the heat for an hour at a time at frequent intervals, and sometimes substitutes the ice bag when the patients are made uncomfortable by moist heat.

Walker (174) believes better results are obtainable through cell rest, rectal drainage, dietetics, massage, baths limited drug administration, than from operation except in cases of hemor-

rhage and perforation. To procure rest, he puts the patient to bed for ten to twenty days with no food or drink except sterile water. After the enforced period the patient is put on hard, dry toast, well salted and thoroughly masticated, juice of red beef, milk, soft cooked eggs, custards, and broths. The diet is gradually increased, and at the same time nutrient enemata are gradually with drawn. By drainage he means cathartics. At the beginning 1/2 grain of calomel is given every fifteen minutes until fifty doses have been taken. During this time a saline laxative is given every four hours. The rectum is flushed very thoroughly with a saline enema. Sixteen grams of castor oil are given the evening of the second day. No more cathartics are given after this. The teeth are thoroughly washed several times each day and the mouth washed with some mild antiseptic solution. Cough is controlled by packs, plasters, pneumo-rectum or morrhine hypodermatically. Internally milk of magnesia, lithium citrate etc. are given by mouth as required during the time in bed. Hemorrhage is treated by morphine and ice packs. Absolute mental and physical rest is considered imperative.

Friedwald (166) recommends the use of scarlet red as an adjunct in the treatment of gastric ulcer and it is particularly serviceable in the treatment of anhidrosis. It does not interfere with the administration of other remedies and mixed administration with the alkalis or alkaloids is at times most beneficial.

The Leube treatment (19) places special emphasis upon diet. Saline laxatives application of heat to the epigastrium. One tablespoonful of saline laxative is dissolved in 500 ccm. of warm water and the patient drinks 5 ccm. of this every 15 minutes until all is taken. Then, in half an hour breakfast is eaten. If one or two urinary discharges do not result the doses of the salts should be regulated accordingly. Heat applied to the epigastrium is one of the essential features for the first twelve or fifteen days. During the first fourteen days the following diet is prescribed: 500 ccm. of milk, 200 grams sweet back and 500 ccm. of meat solution, given as six feedings of 250 ccm. each, the first at seven a.m. and the last at six p.m. The meat solution is prepared by digesting beef with a strong acid solution of pepsin in hermetically sealed vessels at higher than body temperature. One pint contains one half pound of beef. To this may be added, if desired, a small quantity of beef extract and table salt. This gives 1,800 calories of heat per day and if rest in bed is enforced is sufficient to maintain the body weight.

After the fourteenth day the patient is allowed to be up and is given a light diet of pigeon, chicken puree of potatoes, thicker soups, wheat bread, etc. Eight days later the return to coarser foods is effected. All foods are given warm.

Patients with bleeding ulcer are given absolute rest in bed for two or three weeks. For the first three days they take nothing by mouth, but are given two daily nutrient enemata each containing 250 ccm. milk, two or three eggs, and a pinch of salt. On the fourth day feedings are commenced as above. A Pinessnitz compress is kept on the epigastrium.

Yarotsky's (179) treatment is based on the use of eggs and butter. When the patient enters the hospital he gets the next morning even in the presence of hemorrhage one raw white of egg without salt, and in the evening of the same day 20 grams of fresh butter also without salt. Each succeeding day the amount of white of egg is increased by one, and that of butter by 20 grams, until eight whites and 160 grams of butter are given. The latter amount may be continued for one or two days and then mashed potatoes may be added prepared with water and butter. No drinking water is allowed, as this increases the flow of gastric juice. Water may be given in the form of enemata if the thirst is excessive. Later weak, sweetened tea is allowed. Milk is not given for a long time but vegetables with various gruels with oil or butter are well borne.

Sippy (78) briefly describes the technique of his treatment as follows:

The patient remains in bed for three to four weeks. Unless some serious complication is present, some or all of his regular work may be done at the end of four or five weeks. A wide variety of soft and palatable foods may be given. The following plan of diet has been found to be most adaptable. Three ounces of a mixture of equal parts of milk and cream are given every hour from 7 a.m. until 7 p.m. After two or three days soft eggs and well cooked cereals are added until at the end of ten days the patient is receiving approximately the following nourishment. Three ounces of the milk and cream mixture every hour from 7 a.m. until 7 p.m. In addition, three soft eggs one at a time, and nine ounces of cereal, three ounces at a feeding may be given each day. The cereal is measured after it has been prepared. Cream soups of various kinds vegetable purees, and other soft foods may be substituted now and then, as desired.

The total bulk at one feeding while food is taken every hour should not exceed six ounces.

Many of the feedings will not equal that quantity. The patient should be weighed and if desired a sufficient quantity of food may be given to cause a gain of two or three pounds each week. A large variety of soft and palatable foods may be used such as jellies marmalades custards, creams etc. The basis of the diet, however should be milk, cream cereals and vegetable purees. Lean meat is not given during the period of active observation since it interferes with the tests for occult blood in the stools and aspirated stomach contents. The acidity is more easily controlled by feeding every hour and giving the alkalis midway between the feedings. Ten grains each of heavy calcined magnesia and sodium bicarbonate alternating with a powder containing 10 grains of bismuth subcarbonate and 20 or 30 grains of sodium bicarbonate midway between feedings. If the patient has had stagnation of food larger quantities of alkalis are required. For instance, in cases of severe obstruction with duodenal ulcer as much as 100 grains of sodium bicarbonate every hour midway between feedings are used. In cases of partial obstruction of long standing there is usually an excessive secretion when the stomach is empty. This secretion should be aspirated two or three times during the night, if necessary to keep the stomach entirely empty.

Sippy considers that the ideal conditions for the healing of peptic ulcer are maintained when the aspirated stomach contents show absence of free hydrochloric acid during the entire time that food and the accompanying secretion are present in the stomach and all excessive night secretion is controlled.

Sippy considers that the von Leube type of medical treatment is inefficient and incomplete.

All of the methods of medical treatment of ulcers certainly have commendable features but it seems that Sippy's plan is the most nearly complete and the best founded of all.

In connection with the treatment of bleeding ulcer I think it is well to emphasize the fact that an acute bleeding ulcer is never a surgical condition during the bleeding process. If the eroded vessel is so large as to require immediate surgical intervention, the patient will almost certainly die before a decision and arrangements for a surgical operation can be made. If the vessel is not of this size an immediate operation is unnecessary and much more dangerous than conservative treatment. In fact, the hemorrhage will practically always cease if the stomach is put at absolute rest and all nourishment even fluids, withheld from the body for two or three

days. By this, we mean that nothing whatever shall pass into the stomach; no rectal or subcutaneous infusion shall be given at first and if the patient is very restless, morphine should be given. It must be remembered that even fluid taken by the rectum increases the blood-pressure and thwarts Nature's effort to stop the hemorrhage by reducing the blood pressure. An ice bag is placed over the stomach; the patient is instructed to remain absolutely quiet, with room darkened and no conversation permitted.

SURGICAL TECHNIQUE

As has already been stated, most of the original ideas concerning gastric surgery were developed in Continental Europe, while the refinements of technique were developed by American and English surgeons. Intestinal suturing and intestinal anastomosis were developed to a very large extent in America and particularly in Chicago beginning with Swan's bone plate, then Murphy's button and the through-and-through intestinal suture popularized largely by the writings and experimental work of Connell. The Murphy button supplanted Swan's bone plate, and the through-and-through suture supplanted the Murphy button to a large extent, although not entirely. The Murphy button has been pronounced the most ingenious and perfect surgical device that has been produced in the history of surgery and it is still used under certain conditions by a great many surgeons. The perfected holding-clamp for intestinal suturing was early used by Doyen and later by Moynihan who according to Mayo introduced the clamp into this country and in that time it has been quite generally used by surgeons everywhere.

During the experimental stage of the development of intestinal suturing a good many different devices were proposed with the idea of holding the intestine in position while sutures were placed among them the bone bobbin of Mayo Robson, O'Hara's intestinal forceps, Laplace's forceps, the crushed potato button (Colley) (211) which was a short hollow cylinder with a groove into which the edges of the two segments of intestine were drawn with a purse string until the rows of Lembert sutures could be placed after which the shell of potato was crushed and allowed to digest in the intestine or pass on. Later on the author (21) simplified this device by using a thin hollow cylinder of potato over which the two ends of the intestine were drawn and held in position by two transfixion pins, which were withdrawn as soon as the sutures had been placed. These devices worked beautifully

but the author about this time took up an extensive experimental study of intestinal suturing by the Mannell and the Connell methods and found that with sufficient practice the simple through-and-through suture operation was the best, thus making at once all aids to intestinal suturing obsolete for in this same year and same series of experiments the Murphy button was found to be inferior to the simple suture and decidedly more dangerous. As the result, the author has never used a Murphy button or any other artificial device for intestinal suturing except the Moynihan holding-clamps, since this experimentation conducted prior to November 1902. In addition to these might be mentioned the McGraw rubber ligature which was also devised before the complete significance of the through and through suture was understood. Along this line Coffey (183) succeeded experimentally in making an anastomosis without even puncturing either viscus at the time of operation. The two viscera were prepared by cutting a button about an inch in diameter through the peritoneal and muscular coats, down to but not cutting the submucous plexus of vessels. The muscle fibers within and without this circular cut retracted leaving a definite button of tissue. This button was pulled out beyond the contour of the viscus by sponge forceps and a very thin rubber ligature was wrapped several times around the neck of the button which it was proposed to cut out. The two buttons were then brought into contact and the viscera sutured together around the buttons. In about three days the rubber ligature cuts through leaving a perfect anastomotic opening. This method is very applicable and distinctly advantageous in doing an entero-enterostomy after an anterior gastro-enterostomy, and has been used by the author with satisfaction. The ligature is usually a very thin rubber band cut in two at one point.

There are scores of other methods of technique which might be mentioned but all have been made obsolete by the perfection of the through-and-through suture, with or without holding clamps.

The perfection of the through and through suture also made possible the perfection of the operation of gastro-enterostomy which was early recognized as the chief operation in the treatment of gastric and duodenal ulcers. It was soon found that simply the making of a perfect anastomosis was not all that was necessary for following the long loop operation, either with anterior gastro-enterostomy or posterior gastro-enterostomy a certain proportion of these cases

had a persistent vomiting of bile, requiring a secondary operation and at times even producing death. This was known as the vicious circle, and was the most serious feature connected with a gastro-enterostomy at that time. The long loop operation was followed soon by the short loop Mikulicz-Peterson operation, and next by the short loop Moynihan operation, with the intestine applied downward and to the right but with all of these methods, as well as the Roux operation and the use of entero-anastomosis the vicious circle continued to occur in a certain proportion of cases and it was only after Mayo had taught us to apply the intestine to the stomach wall downward and to the left and Moynihan to apply it directly downward that the so-called vicious circle disappeared as a serious or frequent complication.

In doing the anterior anastomosis, the vicious circle is now prevented by applying the intestine directly to the stomach for half an inch to an inch beyond the end of the anastomosis above and below. Occasionally a vicious circle, as Moynihan has pointed out is produced by twisting the intestine on its axis as it is being applied to the stomach. An opening which is too long may permit a partial hernia of the small intestine into the stomach creating a long spur which permits the bile to come into the stomach but, owing to greater intragastric pressure closes the efferent loop of intestine as it leaves the stomach. Occasionally severe adhesions in the neighborhood of the anastomosis will so kink the intestine as to produce a backflow of bile into the stomach. This is relatively rare and it may usually be prognosticated that when a vicious circle occurs it is due to faulty technique.

In performing posterior gastro-enterostomy the question arises whether it is more practicable to do the operation by the use of clamps or to use traction loops with plain suturing. The great majority of surgeons use clamps as routine and it is probably better practice on the average.

However clamps are not entirely without danger as they frequently break the mucous membrane, experimentally and clinically proved. A case (64) of my own has been reported in which the pressure of a very thin bladed clamp of the Moynihan type broke the gastric mucous membrane and so devitalized a blood vessel that it was digested off and produced death by hæmorrhage before the condition was diagnosed. The hæmorrhage began about thirty hours after the operation. A postmortem was held and the bleeding point accurately demonstrated. It is possible that this occurs more frequently than

we know of and no harm comes from it. However it does not occur very frequently for recently when clamps have been used I have released them as soon as the posterior internal suture has been completed in order to examine the mucous membrane. In more than a dozen cases examined recently no break in the mucous membrane has been noted.

It is probable that the ideal attitude to assume on this question is that clamps should be used when they can be applied without tension on the stomach. In fat patients, or patients with a short mesocolon, or with stomach high up under the rib arch the operation can certainly be done more safely without clamps. The technique of suturing is practically the same as that when clamps are used. The jejunum is applied to the stomach usually by the Mayo method downward and to the left. As soon as the direction is obtained a deep traction suture is made to take a deep bite in both the intestine and the stomach picking up the intestine approximately an inch from the ligament of Treitz. Another traction loop is passed a little over two inches farther on and corresponding to the bottom of the stomach. These sutures are tied and used for traction throughout the operation. The peritoneal sutures are placed back of these two traction sutures. Three or four re-enforcement quilt sutures are placed between these traction sutures, including all of the layers of intestine and stomach. The cut is then made down through the peritoneal and muscular coats but not cutting the submucous vessels. The inside suture of chromic catgut, is now placed and may be a buttonhole stitch or a simple over-and-over stitch and is made to include the posterior cut edges of both viscera. The continuous suture is locked the submucous vessels crossing the wound are located and picked up with artery forceps and the viscera opened when the internal suture is continued around, just as when clamps are used. By making traction on the previously mentioned traction loops and also upon the long ends of the internal continuous suture the viscera may be lifted well up into the wound and as we showed in a previous article (64) the fluids in the stomach all gravitate into the fundus of the stomach as soon as the mucous membrane is punctured and the gas escapes. The operation is completed just as when clamps are used and the abdominal tissues are protected from soiling by the use of a roll of gauze back of the suture line and gauze covering the tissues in just the same manner as is customary when clamps are used.

A number of holding-clamps have been devised

such as Moynihan's modification of the Doyen clamp the Roosevelt clamp, which includes both clamps in one, and the Bartlett clamp which consists of three straight bars brought together and held by a set-screw but these are details which may well be left to the personal choice of the operator.

The question of suture material since the frequency and seriousness of gastrojejunal ulcer has been recognized is now under discussion. Since C. H. Mayo (159) expressed the belief that non-absorbable suture material had a great deal to do with the formation and perpetuation of gastrojejunal ulcer and in harmony with this belief began the use of tannin catgut for all of the layers a great deal of discussion has taken place.

Moynihan (213) has for many years used a continuous over-and-over suture of Pagenstecher linen for both the inner through-and-through suture and the external peritoneal suture and has seen no convincing proof that the linen produces the ulcer. It is undoubtedly true that the peritoneal linen suture is frequently found hanging in the wound (as we demonstrated experimentally and reported in 1902 (212)) and has been usually seen when it has been necessary to open a gastro-enterostomy wound for any purpose clinically whether an ulcer exists or not, but there seems to be no certain evidence that the thread is in any way the cause of a secondary ulcer or even that it prevents a secondary ulcer from healing. It may be simply an innocent bystander which has been exposed by the ulcerating process, for it is found that these ulcers may be two or three inches in diameter while the thread is only exposed at one edge of the ulcer (215). Owing to the great weight of Mayo's opinion and his reputation for accuracy however it seems wise to abandon the continuous non-absorbable suture material until the status of the question is more thoroughly established.

It is a very simple matter to use chromic or tannin catgut for the inner suture and fine interrupted linen or silk sutures for the peritoneal line re-enforced possibly by a half dozen through and through quilt sutures of fine linen, which experiments prove, slough out in a very few days.

There are three types of continuous sutures in use for the inner suture first the combined buttonhole suture, and the in-and-out suture as practiced by Mayo second the double cobbler stitch as practiced by Crile third the simple running over-and-over stitch used by Moynihan. There is very little difference as to speed and

accuracy between the stitch used by Mayo and the one used by Moynihan. The Crile stitch is possibly nearer perfection, but is technically difficult for the average surgeon.

After the technique of gastro-enterostomy had been perfected in the Mayo Clinic and in the Moynihan Clinic the results were so good as to produce a sense of satisfaction in the minds of most surgeons, but, owing to the fact that a certain proportion of the patients seemed to have a recurrence of the ulcer or remained otherwise uncured a question arose in the minds of surgeons as to whether gastro-enterostomy after all was all that was needed. Surgeons everywhere began to do more radical work. Some thought the ulcer should be excised whenever possible. Others thought that the pylorus should be obstructed by some means. Von Eselsberg cut off the stomach and turned in the ends, making an operation practically a serious gastrectomy for cancer. Bartlett (200) cut the pyloric end of the stomach leaving the upper and lower borders containing the vessels intact. Wilms ligated the pylorus with a band of fascia cut from the abdominal wall or from the fascia lata. Brewer used a metal band around the pylorus. Bier crushed the pyloric end of the stomach with the angioclasp tied a string around it and sowed the adjacent peritoneal surfaces over the crushed portion. C. H. Mayo and others used an omental band drawn tightly around.

After a sufficient length of time had elapsed doubt arose as to the benefits derived from these various procedures. The simple procedures of placing some kind of constriction around the pyloric end of the stomach have not done as much good as was expected. The Rodman operation and the von Eselsberg unilateral exclusion add so much to the danger of the operation that they are now reserved by most conservative surgeons for special indications.

The operations for excision of ulcers have also been disappointing. The danger of an excision operation plus gastro-enterostomy is very much greater than simple gastro-enterostomy and, what is more the ultimate results are not so good as where the ulcer has not been excised (see Balfour's article, *Transactions Western Surgical Society* 1916) as a very large per cent of conservative surgeons now concede. The von Eselsberg exclusion operation not only adds much to the danger of gastro-enterostomy so far as immediate mortality is concerned but also undoubtedly adds a predisposing element to secondary post-operative peptic ulcers (215).

The Mayo transgastric excision operation is

occasionally indicated. The Balfour cautery operation will probably have an increasing usefulness.

PERFORATING ULCER OF THE STOMACH AND DUODENUM

The seriousness of perforating ulcer of the stomach and duodenum was not recognized until Weir (44) in the year 1900 collected 51 cases of perforating duodenal ulcer reported in the literature up to that time, including one reported by himself. Of the 51 cases operated upon prior to that time only 7 had recovered making a mortality of 85 per cent. In the light of some of the most recent work on this subject a very interesting feature of Weir's report is that of the 44 deaths in the 51 cases, only 2 patients were operated upon before the end of twenty hours. The patients that had recovered were operated upon 10 10 12 12 15 25 and 30 hours respectively after the onset of the symptoms.

Mayo Robson (126) reported 156 cases of perforating ulcer recorded in the literature, and gave a mortality of 66 per cent. Sixty-one cases operated upon within twenty four hours after the onset of symptoms gave a mortality of 37.7 per cent.

Petren (127) reported 135 cases with 60 per cent mortality. Of those operated upon within the first twelve hours 56 per cent recovered during the second twelve hours 43 per cent recovered.

In going over the entire literature of the subject, we find that approximately 50 per cent of the perforated duodenal and gastric ulcers which have been operated upon have recovered. Recent reports however are very much more encouraging.

Deaver (190) reports on 36 cases of perforating ulcer of the stomach and duodenum. Of the 36 cases, he refused to operate upon 10 on account of the serious condition of the patient. Of the 26 operated on, 25 were operated upon before the end of twenty four hours, with no deaths. One was operated upon twenty nine hours after the onset of symptoms, and died giving a mortality of a little less than 5 per cent.

R. P. Sullivan (42) reports 20 cases of perforating gastric and duodenal ulcer with one death, a mortality of 5 per cent. The most interesting feature of Sullivan's report is that the longest time between the onset of symptoms and the operation was fourteen hours, and this occurred in the patient who died. The next longest time intervening was ten hours, the next nine hours, and the remainder of the series were

operated upon between four and eight hours after the onset of the symptoms.

Gibson (48) reports 14 cases of perforated duodenal ulcer with one death. In the one dying the operation was done thirty six hours after the initial symptoms. Of those recovering one patient was operated upon two hours after the initial symptoms 2 of the patients in 2.5 hours 1 in 2.75 hours 3 in three hours 1 in three and one-half hours 1 in five hours 1 in eight hours 1 in eighteen hours 1 in twenty-four hours. Gibson contends that patients operated upon within a few hours, say four or five, should not give a mortality in excess of 5 per cent.

Thus it will be seen that a perforated peptic ulcer if not operated upon early is one of the most serious troubles with which the surgeon has to deal. On the other hand if the diagnosis is made and the operation performed within the first few hours by a competent surgeon the danger is relatively small regardless of the technique of the operation performed. For instance, Deaver in his splendid reports attributed a great deal of his success to doing a gastro-enterostomy with drainage. Gibson has good success without the gastro-enterostomy and finds that the ulcers are mostly cured after perforation while Sullivan thinks that drainage is entirely unnecessary in early cases.

Deaver (190) recommends the following treatment for perforated gastric and duodenal ulcer

- 1 Closure of the ulcer
- 2 Plication of the duodenum to obliterate its lumen, and fortification of this area by covering with gastrocolic and gastrohepatic omentum
- 3 Posterior no loop gastrojejunostomy
- 4 Drainage of the pelvis through a suprapubic stab wound.

The after treatment consists in the use of the sitting posture, continuous proctocolysis, prohibition of everything by mouth until peristalsis is re-established, as evidenced by auscultation and especially by the passage of flatus. The stomach tube is employed freely for vomiting regurgitation, or gastric distention. Experimentation with food is begun after the passage of flatus, beginning with albumin water. No purgatives are given but a cleansing enema is given on the third day after operation.

This is undoubtedly the clearest description and the most rational treatment that has been offered for perforating ulcer provided that the patient is operated upon within the first few hours and the operation is performed by a thoroughly skilled gastro-intestinal surgeon but the occasional operator and the surgeon who is not

particularly skilled in gastro-intestinal surgery will do better to omit the second and third procedures, namely plication of the duodenum and gastro-enterostomy for I think that the majority of surgeons will agree with Gibson (48) that the gastro-enterostomy is entirely unnecessary although it might admittedly be the ideal performance. As Gibson states, nearly all of these patients after recovery from perforated ulcer have splendid ultimate results.

Sullivan (42) reaches the following conclusions:

1 The diagnosis of perforation of gastric or duodenal ulcer should be made in the majority of cases, and the imperative indication is early operation.

2 In the treatment of perforated ulcer gastro-enterostomy can safely be added if the patients come to operation within ten hours after the onset of symptoms.

3 Simple closure of the perforation without gastro-enterostomy is a safe routine but later stenosis is more apt to occur.

4 Drainage can be discarded in early cases especially if operation is performed within six hours after the onset of the symptoms.

5 Early use of a liberal diet should be practiced.

Concerning the stenosis following the closure of a perforated duodenal ulcer it is probable that such stenosis takes place rarely.

The proposal to discard drainage is questionable and would certainly require a larger experience before laying it down as a law.

His fifth conclusion in which he advises the early use of a liberal diet is apparently taking a great deal of unnecessary risk without offering any advantage as compensation.

These very remarkable reports of Gibson, Sullivan, and Deaver all speak the same sentence in unison. Early diagnosis is the chief desideratum in the treatment of perforated ulcer.

Moynihan (213) has probably given the best description of the onset of the symptoms of perforating ulcer. He divides perforations into three classes, acute, subacute and chronic. In the acute perforation the ulcer gives way suddenly and completely the stomach contents are free to escape at once into the general peritoneal cavity. Subacute perforation probably gives way almost as quickly but owing to the smallness of the hole or emptiness of the stomach the infected area is soon surrounded, or the hole is plugged with a piece of omentum. In most cases of subacute perforation the patient has usually been feeling worse for several days before the perforation takes place. These pains are often

vague, general or localized pains, such as spasm or stitch when the patient turns quickly or laughs. In acute perforation, he says that at the moment at which perforation occurs there is the most agonizing and unendurable pain. The least movement seems to add something to its severity. The tense rigidity of the whole body is in striking contrast to the ceaseless unrest of the patient who is suffering the agony of hepatic colic. The abdominal muscles are found to be in a condition of indelible rigidity. Over the ulcer the stiffness is of the most obdurate character one might almost think that a disk of metal replaced the supple muscle. This local increase of general resistance is most definite and distinct, as a rule, and it affords a decided help not only in the diagnosis of the lesion, but in its location. The patient's expression is of one who is terror-struck. The approach of a hand to the abdomen for the purpose of examination is quickly resented and the most piteous appeal for gentleness is made. The breathing is short, jerky and shallow and the patient may indeed cry out that he cannot breathe. Though the patient looks generally ill — with pallid face, staring eyes, and sweating brow — the pulse will be found at the first to be hardly altered in frequency or volume. Unhappily this fact of the unaltered pulse rate is not generally recognized even now accordingly delay which is always serious, may occur. The pulse increases in frequency and decreases in value very soon, but this is not due to the perforation but to the peritoneal contamination, which is the inevitable sequel.

Note. Consultants. See article on Chronic Gastric and Duodenal Ulcer. Surg. Gyne. & Obs. 9, 1907 March 230.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Byford H T The Dry Treatment of Wounds
Tr South Surg & Gynec Ass White Sulphur Springs, 1916 Dec.

The author's endeavor is to provide a dressing that will act with the same efficiency and comfort as the scab on the abrasion. The method recommended is the use of dry absorbent cotton in such a way that it will form a dry dressing that will remain on the wound until healed.

The advantages of absorbent cotton are that it is soft and non irritating and can be easily and efficiently applied by the patient or a friend. The fibers that project on the surface are small soft yielding and absorbent and adjust themselves to the irregularities of the granulating surface. Gauze does not answer the purpose because it is rough and irritating and either receives granulation tissue into its meshes or rubs it off.

No irrigation or disinfection is required the wound being merely dried off when the cotton dressings are changed. A superficial wound with out much discharge requires only two or three changes, two or three hours apart after which the cotton remains dry and is left on until the wound is healed. Wounds of the deeper vascular tissues and septic wounds require the changes to be made over a longer period of time but the intervals are progressively lengthened until they are twelve hours apart then twenty four hours when the cotton usually remains dry and may be left on.

Mann A T Nails and Screws Through Joint Surfaces
Surg Gynec & Obst 916 xliii, 1910.

This series of experiments was undertaken after nailing a fractured and misplaced external condyle in a boy of seven through the joint surface in order to determine the behavior of nails and screws so placed and the joint changes in response to their presence.

In seven knees which were operated upon silver plated screws and ordinary screws and wire nails were inserted through the cartilage surface of the femora so that some of them were below some flush and some in a faulty position and left projecting above the cartilage. In the whole series no joint became infected and no specimen was lost.

The dogs were allowed to run about without fixation of the joints. Most of them favored the operated leg for a time but as a rule they soon lost their limp and all of them were running and jumping about actively at the time the specimens were recovered varying from six weeks and one day to six months less two days. These experiments were done without fractures and without the presence of autografts.

The conclusions are as follows:

1 Nails and screws are tolerated in joint surfaces in the human as well as in the experimental cases and with surprisingly little reaction.

2 They remained firmly embedded in every specimen recovered.

3 In every case where the nails and screws projected above the joint surface there was a distinct upbuilding of the condyle as Nature's reply to a rigid metal body projecting into the joint.

4 It is exceedingly interesting to find that the increase in joint level seems always due to the growth of bone and not to the increase in the thickness of the cartilage.

5 In each case where tissue grew across over the head of a nail or screw or across in the groove of the screw the new tissue showed a reversion to the connective tissue type.

6 Even when the nails and screws have remained more or less uncovered the dogs have run about normally after a short convalescence.

7 In each case the scratch or groove on the opposing surfaces was filled in as the projection of the nail or screw lessened by the upbuilding of the condyle. The defect was apparently entirely filled in all but one specimen and this was closing in nicely at the end of six weeks.

8 As a point in technique it seems better to swing a hinge joint freely at the time of the operation in order to scratch the groove made necessary by a badly placed nail or screw and thus save the time and pain during convalescence which would be required in scratching the groove little by little later.

Yeomans, F G: Surgery of the Aged
Bull Dep. Public Chs 41: 19 61 90.

A summary of 67 cases shows the following:
The number of cases by decades was 40 to 50 years 6 50 to 59 years, 10 60 to 69 years 30

70 to 90 years 11 over 80 years, 1. The extremes of age were 41 to 86 with an average of 62 years.

Sex 43 male, 24 female.

Anesthetic employed ether or chloroform 36 nitrous-oxide gas and oxygen 6 local novocaine 25.

Result recovered 61; died 6 an operative mortality of 9.8 per cent.

The 6 fatalities were

Hernia one on the second day pulmonary oedema one on the seventh day cause not stated.

Empyema of gall-bladder died on fourth day was septic at the time of operation.

Carcinoma of oesophagus very feeble from starvation died second day after gastrostomy with local anesthetic.

Extensive carcinoma of the breast aged 6 general anesthetic palliative operation died fourth day pneumonia.

Sarcoma of neck general anesthetic died suddenly four hours after operation of embolism.

The anesthetic of choice in all cases is local by novocaine one-half per cent was employed in 40 per cent of this series of cases. The second choice especially in the presence of pulmonary irritation is nitrous-oxide gas and oxygen. This is particularly suited to severe but brief operations, as the amputation of limbs. Next comes chloroform in the hands of an expert and, finally ether.

The author's observations justify the conclusion that imperative operations must be performed irrespective of the age of the patient and that, other things being equal in elective cases, age *per se* is not a bar to successful surgical operations.

EDWARD L. CORNELL.

Queen, D. W. The Prevention of Postoperative Gas Pains. *Sessé J. J. 9 6 15, 983*

Quinine was given in a series of 150 abdominal operative cases to prevent postoperative gas pains by the following method: quinine muriate 10 grs. in two ounces of water per rectum every four hours for 4 doses then every six hours for four doses and the following results were noted:

1 Distention and postoperative gas pains were practically eliminated.

2 Nausea and vomiting were greatly reduced.

3 Most of the patients had no thirst at all.

4 Only one case had to be catheterized.

5 Backache was reduced.

6 About 75 per cent had a normal bowel movement during the first forty-eight hours following operation without having received a purge. Of these 3 per cent were drainage cases, 5 per cent had slight distention, and all of these occurred in the drainage cases.

This treatment does not relieve the pain from the incision, which alone in some cases requires an opiate depending on the individual, the presence of drains and the amount of trauma. This enables the patient to get plenty of rest and sleep adds to his

feeling of well being enables the surgeon to better judge the condition of the patient and greatly shortens the convalescence.

ANÆSTHETICS

Gwathmey J. T. Anæsthesia Reviewed. *J. J. 9 6 15 805*

Gwathmey believes that the results in large clinics, where one method of anæsthesia is used in all cases, would be greatly enhanced by the adoption of a more flexible use of anæsthesia.

He does not believe that the theory that rebreathing is prevention of shock can be accepted as a fact. A more accurate conclusion would be that given a patient properly prepared ether may be used indifferently by either the open or closed vapor method. The statement that warmed ether vapor will not stay warmed unless held under pressure, is untrue, as ether vapor can be delivered to the patient at any degree of heat regardless of pressure. Both laboratory and clinical experiments show that anæsthesias are safer and easier when given warm, this holding true with either chloroform, nitrous oxide and oxygen or ether. Experimental animals are killed from two to three times as quickly using cold anæsthesia as when it is warmed. Patients lose only 0.20 F with warmed ether vapor against a loss of 1.0 F with the open drop method.

Gwathmey thinks that the use of proper preliminary medication renders any anæsthesia safer, eliminates largely the possibility of reflex inhibition, and renders induction smoother. Such preliminary medication permits the use of less of the anæsthetic and increases very markedly the margin of safety. He recommends a combination of paraldehyde and potassium bromide given per rectum, and morphine may be given with the paraldehyde.

The lightest possible anæsthesia consistent with the best work is the safest to the patient, deep anæsthesia tending to produce shock through reduction of the pulse pressure. Comparing nitrous oxide with ether anæsthesia the author concludes that animals under ether properly given, stand shock as well as those under nitrous oxide.

Considering anæsthetics from every standpoint, Gwathmey regards chloroform given by the closed method with rebreathing as one of the safest of all inhalation anæsthetics. It is most agreeable and efficient and is easily stopped at once upon the appearance of danger signals. It is simple and adaptable, late chloroform poisoning does not occur and complications are rare while resistance is unimpaired.

Comparing ether by the vapor method with the open drop method, the author finds the former much safer, more agreeable, more efficient, is easily controllable, simpler to administer, is not accompanied by loss of resistance against pus organisms, and not so frequently followed by complications. Ether administered by the open drop method is un-

scientific and should never be used except as a sequence or as a preliminary to some other anesthetic or method.

From a consideration of the various methods of inducing anesthesia the author arrives at the following conclusions:

The drop method of administering ether has won unmerited favor within the past few years because of its apparent simplicity of administration and its supposed safety. It should be discontinued for the simpler and safer vapor method.

Oil-ether colonic anesthesia should be used when ever the anesthetist is in the way or whenever the element of fear dominates the patient. The obese alcoholic is the best subject for this special agent.

Nitrous oxide gas should never be used alone, but always with oxygen. Preliminary medication of some kind should be used in all surgical cases unless contra indicated.

Sequences combinations oxygen, and warmth are additional factors of safety in the administration of nitrous oxide, ether ethyl chloride and chloroform.

E. K. ARMISTEAD

Lumbard J. E.: An Improved Instrument for Maintaining an Oral Air Way During General Anesthesia. *Med. Rec.* 1916 20, 941

The instrument which is an improvement over an older one, should not be introduced until anesthesia is well established and is to be placed between the tongue and soft palate resting in the pharynx. Noisy respiration may be overcome by extension of the head, while some cases do better if traction is made on the tongue previous to insertion of the instrument. It does not interfere with any face mask nor with any method of administering any inhalation anesthetic. It is recommended in all

abdominal operations, especially where the Trendelenburg position is assumed and when there is any obstruction to respiration. A free oral air way is indicated in the following conditions: In cyanosis due to obstructed breathing in unrelaxed muscular conditions with enlarged tongue or in falling back of the tongue.

The several advantages of the tube are that it will not clog with mucus, it is easily inserted and easily kept in position, it cannot be compressed by the teeth or gums, it will not conduct fluid to the pharynx. It may be used on children and it is quickly sterilized.

E. K. ARMISTEAD

SURGICAL INSTRUMENTS AND APPARATUS

Rae, J.: A New Splint for Fractured Humerus. *Lancet* Lond. 1916 cxii, 756

The author describes a metal abduction and traction splint which he has used for fractures of the humerus in war surgery. It consists of a body piece of perforated zinc sheetings strapped to the chest furnishing stability and a wing supported from the body piece by copper rods. The arm is strapped to the wing with the humerus in extreme abduction and the elbow at a trifle less than a right angle. Attached to the horizontal part of the wing is a stirrup with a spring and thumbscrew for obtaining extension. The advantages claimed are:

1. The pull of the deltoid muscles is precluded.
2. The body piece prevents tilting with the weight of the arm.
3. The spring allows tension to any degree up to ten pounds and is more convenient than a dangling weight.
4. It is light weighing a trifle less than three pounds.

W. A. CLARK.

SURGERY OF THE HEAD AND NECK

HEAD

Ground, W. E.: Cancer of the Mouth. *St. Paul M. J.* 1916 xviii, 340

The author reports a case of cancer of the maxilla, which began as a leucoplakic patch on the gum and spread back to the tuberosity involving the cheek. The left side of the maxilla together with the affected portion of the cheek, was removed. As preliminary steps the external carotid artery was ligated and infrathyroid laryngotomy was performed. The author prefers the latter to tracheotomy in these cases.

Owing to the lesion having been diagnosed elsewhere as syphilitic solely on the basis of a positive Wassermann reaction and mistakenly treated as such without benefit, and the author having made the correct diagnosis by microscopic examination of an excised specimen, the questions of the relation of syphilis to cancer of the mouth, the proper inter-

pretation of the Wassermann reaction and the cause, nature and relation of leucoplakia to syphilis and cancer are considered in detail.

Given a chronic sore in the mouth, the presence of syphilis not only does not preclude malignancy but actually favors it. Chronic ulcerous lesions about the mouth often combine the inflammatory the epitheliomatous, and the syphilitic features. Mistakes will occur when too much dependence is placed in laboratory findings just as surely as when clinical observation is dogmatically relied upon. The threadbare expression that the harder the diagnosis the easier the treatment, and conversely the easier the diagnosis the more difficult the treatment is truly applicable to cancer. When at all accessible, cancer is even more curable than tuberculosis and the majority of cancer localities are accessible. If any progress is to be made toward mitigating the cancer menace it will be through the study of pre- or early cancer conditions.

P. G. SKILLMAN, JR.

Sebleau P. The Natural Cicatrization and Treatment of Ballistic Fractures of the Lower Jaw (De la cicatrization naturelle et du traitement des fractures balistiques de la mâchoire inférieure) *Bulletin Soc. de Ch. et Par.* 96 III 433

War injuries of the lower jaw are of three categories: (1) they are comminuted (2) they are infected and consequently exposed to necrosis (3) they are often times coexistent with severe injuries of the soft parts.

The loss of substance due to the comminuted condition plus the loss due to necrosis leads to shortening which is the fundamental characteristic. In these ballistic fractures a decision depends on the developments which dominate their further history: viz. a pseudo-arthritis due to the formation of a firm callus between the maxillary fragment or vicious bony consolidation which creates vicious articulation.

In the treatment of fractures therefore the common methods used with ligaments fractures are called for. Reduction and compression as early as possible and the application of retention apparatus at the very earliest time that the patient condition will permit. If delayed reduction may be extremely difficult even after a week and after a certain time quite impossible there then nothing left to be done but to apply to the patient a prosthesis, ingenious perhaps but imperfect which only lessens the functional impairment. Recourse can of course be had to osteotomy and Sebleau has had occasion during the war to perform osteotomy in 30 cases of vicious consolidation. Of these twenty had a good articulation after operation.

Another point which should be attended to in the treatment of these fractures is the scarical fusion between the bone and the soft parts adhesions may form between the bone stumps and the skin, floor of the mouth, tongue lips etc. This must be attended to by primary or secondary sutures correct general deformities. Autoplastic operations of various kinds.

If after reasonable amount of immobilization of fractured parts in anatomical position there is not sufficient consolidation of the bone it may be necessary to resort to osteosynthesis. Sebleau has performed this operation in eight cases with encouraging results. W. A. BRENNAN

Parsons, A. L. Cranial Fractures. *Am. J. S. S.* 916 333

Parsons reviews the present status of our knowledge of cranial fractures, emphasizing certain points from his personal experience. Classification, mechanism of production, symptomatology and diagnosis of these injuries are taken up in detail followed by a discussion of the indications for palliative and operative treatment. The importance of roentgenography in every case of suspected cranial fracture is emphasized. Operation should be performed in every case where the symptoms are in-

dication of cerebral laceration or compression. Early operation under these circumstances is imperatively demanded if while the pulse rate remains low before intracranial pressure is markedly increased, before the blood pressure is lowered, and before the dangerous stage of medullary compression and cerebral anemia has been reached. Late operations under these conditions are usually fatal.

ROBERT H. IVY

Leri R. Value of Lumbar Puncture in Cranial War Wounds (Valeur de la ponction lombaire dans les plaies du crâne par projectiles de guerre) *J. de Ch.* 96 45

From his observations Leriche says that in the case of a crushed or fractured skull the cerebrospinal fluid is as often clear as colored and that consequently no certain conclusions can be drawn from the external aspect. It would be an exaggeration to tell from this alone whether to practice or reject trepanation.

In simple scalp injuries, the fluid is habitually clear but is colored in about 6 per cent of cases. In wounds with fracture of the skull or contusions it is habitually colored but very often clear. The color diagnosis therefore is deceptive in almost half of the cases and cannot be looked on to furnish an operative indication.

The author further finds that the tension of the fluid has no diagnostic value. The pressure of the cerebrospinal fluid is augmented in the majority of cases of injury by shells, because in such cases the meninges are torn. In some of explosions in general since in combat it is exposed to such areas where there is disturbance of atmospheric pressure whether a cranial wound is by shell or bullet it would be accompanied by hyperextension of the cerebrospinal fluid.

The author has made cytologic examinations of the fluid in cranial injuries while confirming him in his view that such are of diagnostic value yet show that repeated punctures have a therapeutic effect which is of the highest value to the patient in these cases. W. A. BRENNAN

Scandola C. Closure of Breaches in the Cranial Vault (Chiusura delle breccie della volta craniche) *Riforma med.* 96 II 983

Scandola reviews the various procedures for closure of solutions of continuity of the cranial vault. The large number of cranial wounds in the present war have brought the subject into prominence. Metallic and celluloid plates have the disadvantage that it is difficult to keep them in position. The reimplantation of the fractured pieces or a transplant of bone taken from some other part have not given secure results.

Without wishing to enter into the relative value of autoplasmic or heteroplasmic methods, Scandola wished to ascertain if the rubber sponge which Fieschi used first in the treatment of cranial hernia

could be used to close a solution of continuity in the cranial vault. For this purpose be carried out some experimental researches on rabbits and his results permit him to affirm that the rubber sponge serves excellently in the experimental field to close breaches in the cranial vault. The occlusion which is obtained is solid and does not cause any inconvenience. In his experiments some meningeal adhesions were found to have formed but he thinks that this effect can be obviated by using thin plates of sponge rubber with a smooth face and he will employ this in a further series of experiments.

W. A. BRENNAN

Mueller F. The Operative Treatment of Cranial Gunshot Injuries (Zur operativen Behandlung der Schäradeleschüsse) Beitr. z. klin. Chir. 1916 c. Krugschir Hefi 73

In the last 11 months since Mueller took charge of the surgical division of the Tiltsi Hospital he has treated 180 gunshot injuries of the skull among which were 11 through shots, 20 retention shots, and 146 ricochet and tangential shots.

There is no doubt as to the seriousness of the injury in segmental and diametrical gunshot injuries where the brain is usually involved, but in tangential and retention gunshot it is only in a portion of the cases that serious symptoms are evident on inspection and even the roentgen examination is often not reliable. Such injuries may for a long time give no indication of dangerous injuries to the skull and brain. To await such symptoms leaves the patient in constant danger of his life, the attendants in continual worry and the responsible surgeon cause to reproach himself later.

From these considerations Mueller decided to expose every cranial injury even those appearing harmless. As a rule the situation becomes clear with one incision. He is fully convinced that a great part of his success is due to such primary intervention. The distribution of the 180 cranial injuries is shown in the table below.

| Situation of Cranial Injury | Total of Cases | Deaths Due to Injury | Mortal Per Cent | Recovered Cases | Recovery Per Cent |
|-----------------------------|----------------|----------------------|-----------------|-----------------|-------------------|
| Soft part gunshot | 46 | 0 | 0 | 46 | 100 |
| Extradural gunshot | 3 | 0 | 0 | 33 | 100 |
| Intradural gunshot | 38 | 1 | 2.63 | 37 | 97.37 |
| Brain gunshot | 74 | 20 | 27.0 | 45 | 60.81 |

Of these 41 were primarily operated; 4 died 60 per cent recovered.
33 were secondarily operated; 5 died

Of the 180 skull injuries 132 were treated by early operation. Of these 60.5 per cent were operated upon within the first week of the injury 29 per cent in the second week, and the remainder in the third week and later. Of the 180 cases, 31 died, 30 from the direct results of the injury. Four patients died later in their home hospitals. Most of these deaths were caused by brain complications which were clinically of two distinct types. In the first the symptoms were of a fulminating character accompanied by high temperature and resulting in early

death. The parts of the brain softened by the wound oozed continuously indicating strong intra-cranial tension. It was not demonstrated whether or not there was a bacillary activity but such assumption is plausible. In the second type the symptoms were insidious the destructive process extending gradually until it reached a ventricle when rupture occurred followed by a suppurative ventricular inflammation and a bacillary meningitis.

From the percentages of mortality and recovery the final success of the operative treatment can be established. First there is the noticeable result that of all extradural injuries there is an operative recovery of 97 per cent.

Of the gunshot injuries involving the brain sixty-one per cent recovered. Mueller's statistics show that after primary operation alone sixty-six per cent finally recovered. In those cases where a secondary operation was later necessitated there was only 33 per cent of ultimate recoveries. As against the 33 per cent recovered after secondary operation the primary operated cases give a total recovery of 66 per cent. This comparison shows the importance of primary operation. Mueller thinks that in reference to gunshot skull injuries, success or non-success depends upon the favorable issue of the first operative treatment. Retention gunshot wounds have a high mortality of 70 per cent showing how destructive are the effects of a projectile remaining in the brain.

In primary operated tangential shots the mortality is 22.73 per cent which gives the pleasing result that of 100 tangential shot injuries, 77 recovered owing to primary operation.

W. A. BRENNAN

Neven Lemaire, Debeyre, and Rouvier: Trepanopuncture of the Lateral Ventricle in the Prolonged Form of Meningococcal Cerebrospinal Meningitis (Trépano-puncture du ventricule latéral dans une forme prolongée de méningite cérébro-spinale à meningocoques) Press. méd. 1916 p. 415

The authors recognize the beneficent effects obtained from rachidian puncture and specific serotherapy in meningococcal cases.

In normal conditions the subarachnoid space and the cephalorachidian fluid which it contains is common to the whole cerebrospinal axis, and in communication with the cerebral ventricular cavities. But in pathologic conditions of meningitis there is an obstacle to such free intercommunication and fluid is retained in the ventricles such fluid may be clear (hydrocephalus) or purulent (pyocephalus). Under such circumstances it is easily understood why rachidian puncture does not permit curative serum to penetrate into the cavities and the only logical intervention is ventricular puncture followed by intraventricular injection of serum. This intervention is simple and benign and if practiced opportunely causes the immediate disappearance of the phenomenon of intercranial hypertension, and effects complete

recovery even in cases which apparently are of the most desperate kind. The authors give the clinical details of such a case.

As regards technique, the authors point out that there are three routes of approach to the lateral ventricles i.e. the frontal the temporal or sphenoidal, and the occipital. They select the frontal route and indicate the method of precisely limiting its position and locating the best orifice for trepanation. The scalp having been cleared and treated with iodine tincture penetration is effected by a needle about 8 cm long and 7 mm. in diameter which is pushed for a distance of about 4 cm through the dura mater. After the withdrawal of about 35 ccm of fluid an injection of 5 cm. of antimeningococcic serum is made into the ventricle.

The operation can be done in a few minutes and does not appear to entail any danger. The results obtained in the case reported give the authors full confidence in the future of trepanopuncture of the lateral ventricles in the prolonged form of meningococcal cerebrospinal meningitis. W. A. BAKER.

Weygandt: Giant-Cell Sarcoma of the Brain
(Riesensarkom des Hirns) *Dtsch. Arch. f. Klin. u. Chir.* 96, 212, 77

Weygandt refers to the case of a man who suffered a head injury by falling from a rail road car. Following the injury he was unconscious for a couple of days. There was wound on the posterior part of the right parietal bone which in time healed up. His after history however showed mental and nervous disturbances for about two years, and these were considered by the medical examiners to be the result of a traumatic hysteria and hypochondriacism. With this history he entered Weygandt's service and his examination based on the eye symptoms vomiting subjective and psychical symptoms, resulted in a diagnosis of brain tumor. Stupor and sleeplessness were the most pronounced symptoms and these later were supplemented by incontinence of urine. Death occurred about three months later and about two and one-quarter years after the accident. Autopsy showed that the dura was pushed to the left above the frontal extremity. The asymmetry of the brain, viewed from all sides was immediately noticeable, the left large brain being strongly thickened in the frontal lobes and the central front convolution being considerably flattened out. Upon resection a tumor was found about 5 cm. in diameter and extending from the lower cortical layers to the optic thalamus. Histologically this tumor was a giant-cell sarcoma a form of brain tumor which is very seldom observed.

It is to be remarked that although the trauma occurred upon the right side of the skull the tumor developed upon the left side. A further development of the trauma is possible, causing disturbance in the vessels and brain substance. The existing ailments must be referred to the situation of the tumor near the left motor centers. A giant-cell sarcomatous tumor of the brain is very

seldom observed. The author thinks it rather remarkable that even up to three months before the patient's death the well-developed symptoms should have been so misunderstood and the patient's ailment treated as a psychosis. W. A. BAKER.

NECK

Priest J and Colomblie P: Two Cases of Supernumerary Ribs of the Cervical Region (Causes anormales de la région cervicale) *J. de Radiol. et d'Elect.* 9, 44

The authors in examination of wounded soldiers, have met with two cases of cervical rib. In one of these cases there were two supernumerary ribs, one at the level of the sixth cervical vertebra which was incomplete, its anterior extremity not reaching to the sternum the second rib at the level of the seventh vertebra was complete. Above the two ribs were bosses which simulated costiform apophyses. Electrodiagnosis showed disturbance of the brachial plexus evidently caused by compression.

In the second case radiography showed the existence of a supernumerary cervical rib at the level of the seventh cervical vertebra, this being incomplete and articulating on a transverse process abnormally hypertrophied. There was besides at the level of the sixth vertebra a voluminous transverse apophysis. W. A. BAKER.

Winslow R T: More of the Carotid Body. *J. Surg. Phila.* 96, 14, 57

A tumor of the carotid body usually presents no subjective symptoms, although there may be some symptoms of pressure in the recurrent laryngeal nerve. The patient generally seeks advice on account of the presence of an oval tumor which has increased in size over a period of years until it has attained the size of a pigeon's egg, or even a hen's egg. This tumor is found opposite the thyroid cartilage. It has an upheaval pulsation and a bruit from its close relation to the carotid vessels. At times there is an irregularity of the pupils from pressure on the cervical sympathetic ganglia. The growth is encapsulated unless malignancy is far advanced. It is rarely diagnosed before operation, but the presence of a single, slowly-growing firm, smooth discrete oval lump opposite the thyroid cartilage either anterior to or under the sternomastoid muscle should arouse suspicion. The type of tumor is usually an endothelioma or perithelioma, which is generally benign or but slightly malignant at first but if not removed tends to become malignant.

In 906 Keen collected 29 cases and in 93 Callison and MacKenty were able to add the reports of 31 more. The author has been able to collect 6 more cases since that time and adds two cases which have come under his personal observation. The treatment of such cases is surgical where there is any hope of complete extirpation, although

the operation carries considerable risk due to the fact that it is usually necessary to ligate the carotid, and perhaps remove or injure the hypoglossal and pneumogastric nerves. In 25 cases in which the common and internal carotids were ligated only one died from the operation, which is considerably less than the usual percentage of cerebral softenings following ligations of this type. The tendency to recur in the cases in which the tumors have been dissected from the vessels warrants radical removal with resection of the carotids.

GATEWOOD

Mockenzie, H. Exophthalmic Goiter *Lancet*
 Lond. 9 6 cxi 815

The author gives a careful statistical study of exophthalmic goiter with his deductions therefrom.

In regard to the incidence of the disease, ten females are affected to one male. The fatal cases are fairly evenly divided in the five-year periods of age from fifteen to sixty. The disease is rare in childhood, although there have been cases reported as young as two and one half years. Mackenzie has never seen a typical case under twelve.

The relation between mental disturbance and the disease was definitely traced to some more or less severe mental shock or strain, worry or anxiety to at least a third of the author's cases. Although the onset after mental disturbance is usually gradual it may be quite rapid. Two such cases, both males have come under the author's care. Each had developed a typical case of Graves disease three months after mental shock. It is logical to believe that the severe emotional strain on millions of people during the present war will cause a marked increase in the number of exophthalmic goiter cases. Although this emotional disturbance may be present in many cases, yet there is such a large percentage of cases with no such causative factor or any known etiology that we must admit prevention of the disease is beyond our power.

Persistent thymus gland was found in 26 of the 36 cases which came to autopsy at the St. Thomas Hospital. A status lymphaticus is found in most cases of Graves disease which succumb under operation. Yet status lymphaticus is a condition more prevalent in males than females. When specifically described, the thyroid gland was always enlarged. The histological picture was in most cases typical of Graves disease. In more than half of the fatal cases the duration of the disease was less than eighteen months.

The blood picture which is fairly constant in exophthalmic goiter is a leucopenia with a relative lymphocytosis. Of the newer tests which reveal overactivity of the thyroid gland only two are simple enough to be of practical value. Boudouin and Porak found that after hypodermic injection of the extract of the posterior lobe of the hypophysis the pulse of the normal individual accelerated while that of exophthalmic goiter patients became perceptibly slower. Poewis test is dilation of the pupil of exophthalmic goiter patients following the

instillation of 1:1000 adrenalin into the conjunctiva. This test is likewise positive in diabetes. The severity of the illness bears no relation to the size of the thyroid gland. The author has observed several cases in which the symptoms grew constantly more severe with a steady decrease in the size of the gland. Such cases showing marked wasting which is generally an unfavorable symptom. Three cases of from nine to twenty years' duration are cited as examples of the long duration and slow progress of the disease, contrasted with which is one rapidly fatal case of only two and one-half months' duration.

The author believes that 25 per cent of all cases of Graves disease terminate fatally 50 per cent under ordinary medical treatment attain more or less complete recovery and in the remainder the disease is chronic throughout life. The recoveries are naturally most frequent in the milder types of the disease.

In regard to treatment, under similar conditions some cases improve rapidly some remain stationary some steadily lose ground and terminate fatally. The most useful drugs are bromides where nervous symptoms predominate, belladonna to quiet the heart, opium to check diarrhea, phosphates and calcium salts for wasting. The author finds no value in organic preparations. Milk or serum from thyroidectomized goats and thyroidectine (Merck) have been equally inert in his hands. He takes a favorable view of X-ray treatment which must be pushed to get results and in many cases must be persevered in for a long period of time. It is most likely to prove beneficial in cases where the thyroid enlargement is moderate and the patient is not so seriously ill as to necessitate confinement to bed. He is uncertain of its usefulness where the goiter is large and in cases of severe type and rapid course. It fails as do all other measures. One case is described in which X-ray treatment caused atrophy of the gland to a stage of myxedema which was subsequently controlled by thyroid tablets.

The author is not at all impressed by the results of surgical treatment of exophthalmic goiter. Since 1905 in 15 cases at St. Thomas ligation of the thyroid arteries was performed and in 19 cases thyroidectomy. The former gave a mortality of 20 per cent, the latter of 42 per cent. He does not understand the favorable reports from large surgical clinics. He never advises operation in his private cases some of whom have gone elsewhere for operation. Little or no improvement or fatal outcome is noted in those cases which he has been able to follow.

E. FISCHER.

Ochsner A J: Exophthalmic Goiter *Ann Surg*
 Phila. 1916 lvi 385

That the pathological state of the thyroid gland found in exophthalmic goiter can and does return to normal is proved by clinical cures of exophthalmic goiter without removal of gland substance and the physiological enlargement of the thyroid at puberty when all symptoms of exophthalmic

goiter may be present in a mild degree promptly to subside under appropriate non-operative treatment. Nevertheless, there is such abundant proof that definite pathological changes in the thyroid gland accompany exophthalmic goiter that the operative treatment of the disease by removal of this pathological tissue must be deemed a rational procedure.

The author insists that surgical treatment of exophthalmic goiter begins. If it has been established that medical treatment can not permanently cure the patient. He believes that thyroid extract, digitalis, and iodine should never be used in the medical treatment of the disease. He believes he has seen deaths directly attributable to the use of each of these drugs.

When operation is decided upon selection of the proper time to operate is of the most importance. Operation is never advisable during exacerbation and an operation should not be undertaken if the patient expresses fear. The amount of surgery done at one sitting should be limited to the amount of surgery the operator deems safe for the patient which varies from ligation of one vessel to double lobectomy. The author prefers the regular meshner incision even for ligation of vessels, as it permits ligation of the anterior thyroid vessels in addition to ligation of both superior and inferior thyroid arteries at the end of the gland most affected. The injection of boiling water into the gland of patients too severely toxic to stand even a ligation has proved valuable in the limited number of cases where tried. No matter what the preliminary operation the patient should receive the same careful after-care as though the radical operation had been performed. The latter should always be done when the patient has received the maximum benefit from the preliminary operation and should never be omitted because of an apparent cure.

Occasionally that the margin of safety to the exclusion of the gland can be normally widened by a transfusion of 400 to 600 cc. of blood at the beginning of the operation. In regard to anesthesia as he believes that either by the open drop method is the only safe method for general use. Morphine and atropine are given one half hour before the anesthetic. The patient is fully anesthetized the head of the table raised and no more anesthetic is given after the operation is started. Before the patient is returned to bed if there have been marked symptoms of hyperthyroidism stomach lavage with water at 50°F. is performed to eliminate mucus in the stomach, which the author believes is a predisposing factor in postoperative hyperthyroidism. Local anesthesia—0.5 per cent novocaine plus adrenalin—will entirely eliminate the danger of the anesthetic. It also limits trauma to the minimum. Hemorrhage should be prevented by clamping all vessels between the forceps before cutting. The wound should be drained.

Injury to the recurrent laryngeal nerve and to the parathyroids can certainly be avoided by

ligating the inferior thyroid arteries anterior to the posterior thyroid capsule the latter being allowed to remain undisturbed in its relation to the trachea. In cases with absorption of one or more tracheal rings when collapse of the trachea follows removal of the gland tracheotomy should be immediately performed.

The author lays the greatest stress upon the importance of after treatment and gives a set of rules for goiter patients. With the exception of patients who have had too little gland substance removed, he had had a definite enlargement of that portion of the gland left behind. In operation the author believes that all recurrences are directly attributable to faulty or incomplete postoperative treatment. E. L. MERRILL.

Plummer W. A. Some Phases of the Differential Diagnosis of Exophthalmic Goiter. St. Paul. *St. J.* 9 6, 1911, 397.

The author confines his article to the differentiation of exophthalmic goiter from neurasthenia with which it is most frequently confused.

Hyperthyroidism has a definite reaction in its signs and symptoms commensurate with the size of the dose of thyroid secreted. Thus a pulse-rate of 20 associated with cold dry hands means that hyperthyroidism can only be excluded because dose sufficient to produce such a tachycardia will necessarily cause vasodilation with warm, moist skin. In the history both neurasthenia and exophthalmic goiter show marked fluctuations in the severity of the symptoms. But the wave lengths of remissions in neurasthenia are much shorter and more irregular than in exophthalmic goiter the former being measured in hours and days, the latter in weeks and months. Too much stress is laid upon a history of nervousness, palpitation, and tachycardia. The nervousness of the exophthalmic goiter patient is first noticed by the friends as a certain restlessness, desire to be active all the time. Palpitation and tachycardia are frequently met with in other conditions and are important only when associated with signs or symptoms of increased metabolism such as good appetite or hyperhidrosis, with subjective sensation of heat which must not be confused with the transitory hot flashes and cold sweats of the neurasthenic who likewise frequently complains of poor and capricious appetite and who is usually very introspective which is the exception in exophthalmic goiter patients.

The nervously depressed patient with neurasthenia presents a marked contrast to the exophthalmic goiter patient. The former on entering the examining room walks languidly across the floor and sinks into a chair with a deep sigh she appears utterly exhausted. When asked to mount the examining table she hardly seems able to make the effort but after some coaxing will accomplish the feat without any evidence of weakness. The appearance of exhaustion in the neurasthenic is

purely subjective — there is no true myasthenia. Contrasted with this picture the exophthalmic goiter patient walks briskly across the room sits straight in her chair and gives the picture of physical and mental animation. She underestimates the seriousness of her condition, walks briskly to the examining table and is much chagrined to find she cannot mount without assistance. The weakness of the quadriceps extensor muscle is quite characteristic. If a patient neither looks nor acts as though intoxicated from the thyroid the history and the physical examination will seldom give the necessary evidence on which to base a diagnosis.

The neurotic patient is abnormally cognizant of the physiological activities of internal organs. Her tachycardia fills her with apprehension. The tachycardia of thyroid origin is more regular and less subject to slight external influences. The tremor of the two conditions may be similar but that of neurasthenia is intermittent.

In the examination of the throat, the hyperplastic thyroid of exophthalmic goiter stands out more definitely and feels granular to the finger. Thrills and bruits are heard over the superior thyroid vessels in 80 per cent of the cases and a large percentage show a faint but distinct harsh blowing systolic murmur in the pulmonary area — two signs not found in neurasthenia. E. FISCHL.

David, V. C.: Results of Operative Treatment of Exophthalmic Goiter. *Ann Surg Phila.*, 1916 liv 400

A series of 200 successive cases of exophthalmic goiter operated upon at the Presbyterian Hospital

Chicago had a hospital mortality of 5½ per cent. A list of questions was mailed to the remainder to which 56 replies were received. Cases in Group 1 with moderate symptoms of hyperthyroidism had a pulse-rate of 90 to 100. Lobectomy was done in all 6 cases, 3 reported themselves as cured, 3 greatly improved, but still nervous. Group 2. Among 35 patients with marked symptoms of hyperthyroidism lobectomy had been done in 33, double ligation in 2. 31.4 per cent were cured, 40 per cent greatly benefited, 23 per cent slightly benefited, 6 per cent no benefit. Twenty four were able to work and assume ordinary responsibility. An average of 21.6 months elapsed between the appearance of symptoms and operation. Group 3. Among 19 cases, with very severe types of hyperthyroidism, pulse over 120 and great prostration, lobectomy was done in all. 47.3 per cent were cured, 31 per cent greatly improved, 3 were somewhat improved, 1 received no benefit, 14 were able to resume their ordinary duties. Symptoms were present on an average of 26.7 months before operation.

In the entire series 49 per cent were able to attend to all duties, usual or extraordinary, 18 per cent were unable to work at all. The average duration of the disease in the cured cases before operation was 16.7 months, and excepting 3 patients was 9.8 months. Lobectomy was done in 24 cases, ligation in 1, only 6 of 15 cases were relieved of exophthalmos.

The average duration of symptoms in the 3 cases receiving no benefit whatever was 33 months. Of all the cases considered 38 per cent had had a goiter for months or years before the onset of symptoms of hyperthyroidism. E. FISCHL.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Howard C. P. The Symptoms and Physical Signs Resulting from Wounds of the Chest. *Am J M Sc*, 1916 cli, 650.

Howard analyzes 87 cases of chest injuries observed by him while on duty at a base hospital dividing them into four groups.

Group 1 consists of 15 cases presenting no abnormality in the lungs or pleura at examination although 7 were penetrating wounds.

Group 2 consists of 6 cases, 4 being pneumonia and 2 serous pleurisy with effusion. In 2 of the cases of pneumonia the involvement was on the side opposite to the wound.

In Group 3 is placed a case of mediastinitis from a bullet lodged in the anterior mediastinum. The symptoms were pain over the upper and outer border of the right trapezins and slight dysphagia, there was definite dullness over the entire anterior mediastinum and extending 1 cm. to the right of the sternum. There was likewise the grating friction

sound described by Perez, and the X ray showed the bullet behind the manubrium.

In the last group are 65 hemothorax cases, 9 of which were infected, the infective organisms being a gas bacillus, bacillus tetani, pneumococcus, streptococcus, staphylococcus aureus and a large unidentified bacillus probably from the diphtheroid group. In 2 of these cases, the gas bacillus and the diphtheroid, the infection remained dormant 10 and 18 days respectively.

Physical signs differed in no way from those of the sterile cases. The temperature pulse and respirations, however, were markedly increased.

In only 2 were definite signs of pneumothorax noted, while in a third air and pus could be seen and heard sucking in and out of a large wound in the upper back, although there were no characteristic signs of pneumothorax.

In 4 cases thoracotomy was done, 2 recovered, 1 died and 1 improved. One case was merely aspirated and discharged as improved. Of the remainder 3 died before surgical procedures could be

Instituted, and one refused operation, being sent to England. The most striking feature was the slowness of convalescence after thoracotomy.

There were 56 cases of sterile hemothorax of which all but 6 had penetrated the chest cavity.

Cough was present in 41 cases and was of the short, sharp dry character seen in ordinary pleurisy. Sputum was strikingly absent except in those with definite hemothorax.

Hemothorax was noted in 30 cases in varying quantities. Fatal hemothorax occurred only once in a thousand cases seen by the author.

Dyspnea occurred in only 2 cases was rarely marked and usually of short duration.

Pain in the chest was present in 24 cases usually at the site of the wound. It was not noted in 25 cases and was absent in 7.

Fever of varying degree was noted in 47 patients. This was probably due to infection of the parietes or to the absorption of the blood in the pleural cavity.

The pulse was accelerated in every case but only markedly in 6. This was due no doubt to exhaustion and shock.

Respirations were normal in 43 cases and markedly accelerated in only 12.

There was invariably a diminished movement of the affected side and after several weeks a considerable degree of reaction of the chest wall was observed due to the marked collapse of the lung which however was recovered from with the aid of suitable exercises.

Palpation revealed a subcutaneous emphysema in 10 cases, although only 3 showed signs of pneumothorax. Tactile fremitus was diminished in 90 per cent of the cases, vocal fremitus but rarely.

Breath sounds were either suppressed or absent although in 10 cases they were noted as bronchial over the back or above the line of effusion. Vocal resonance was increased in 11 and diminished in 12. Rales were heard in only 7 cases, a pleural friction in 12.

Cardiac displacement was fairly constant. The striking feature was the marked degree of displacement even with a relatively small effusion, this being due no doubt to an early pneumothorax.

There were 8 cases of a doubtful pneumothorax and in all the signs of air in the chest rapidly disappeared, usually within 24 hours. The author believes a mild form is of common occurrence in penetrating wounds of the lung.

Lobar pneumonia was present in 4 cases all being on the side opposite the effusion. Why is not understood.

Secondary hemorrhage is exceedingly rare under proper care. Howard mentions only one instance.

A case of pneumopericardium is mentioned which will be fully reported later.

The treatment consists of absolute rest in bed with a bland nutritious diet. Absorption occurs at about the end of two weeks. Occasionally aspiration of varying amounts of the fluid will stimulate

the absorption. It never reaccumulates. The fluid withdrawn rarely clots, due to the fact that the fibrin separates out *in situ* on the visceral and parietal pleurae.

Howe mentions the use of oxygen replacement coincidently with the aspiration in 2 cases and suggests its wider adoption.

Of the series of 87 cases, 6 died, 4 from infected hemothorax, 1 from amebic liver abscesses and 1 from infected bullet tract in lung. Sixty-nine were discharged well and 1 improved.

P. M. CHASE.

Percy J. F. Technique for the Radical Cautery Operation in Breast Carcinoma. *T. West. Surg. St. Paul, p. 6 Dec.*

Percy insists that the most important improvement that can be made in the technique of the modern operation for breast carcinoma is the use of the hot knife in place of the cold steel knife. He gives cases in which the recurrences, following the knife, have been very extensive, especially in the skin and in the line of suture. He advises that the wound be left open in order to watch for small points of recurrence which if they appear can be cocaine used and treated by heat at once. After the wound has been made no matter how extensive epithelialization can be hastened by covering with strips of adhesive plaster as recommended by Beck.

The author insists that carcinoma is most prone to recur where blood vessels are left in the wound, and that practically every recurrence is about a blood vessel. He uses this clinical fact to urge that no bleeding vessel be clamped with a hemostat, but more important that the bleeding should be arrested by the application of the cautery knife. This not only stops the hemorrhage but kills the most common origin for the cancer nidus in its incipency.

Percy advises that an X-ray picture be made of the thorax. If metastasis into the lung, pleura, or ribs is disclosed the treatment should consist of massive doses of X-ray administered by expert X-ray operator. Much unnecessary sequent suffering will be avoided in this way that otherwise would result from the improper use of this powerful agent. Good omen.

The actual technique of the use of the cautery knife is essentially like the ordinary technique with the cold steel knife. When one becomes familiar with this, the danger is no greater as far as the axillary dissection is concerned, than with the scalpel. More than this there is a great satisfaction in knowing that the hot knife is not disseminating carcinoma in its way through the tissues, and besides, the heat is having an influence for good considerably beyond the area involved in the immediate contact with the cautery knife. The heat can be made to penetrate safely where the cautery or cold steel knife cannot go.

Percy considers it a most vicious practice to use gauze dissection in the axillary space and insists

that this technique is responsible for many of the recurrences following the ordinary methods in this operation.

The patient's postoperative recovery is a smooth one. The only difference being that the serous drainage persists for a longer time.

The four most important things in the technique are: (1) The limits of the incision to be made should be marked out on the iodine-covered skin surface with the handle of the steel knife. (2) One should not cut with the cautery knife from above down ward into the skin, in following this line but from within outward. (3) It is very important in dissecting about the axillary vessels and brachial plexus to hold the parts that are to be removed with the fingers of the free hand encased in a medium weight rubber glove and keep the fingers close to the cautery knife. This is the most practical way of gauging the degree of temperature that the tissues and blood vessels will stand without being injured. (4) The heat should be applied until all the tissues that were fixed by the disease are freely movable. To do otherwise simply means that heat dissemination in the most effective way has not been obtained.

Alfaro A. and Hardey, P. J. Indications and Results of Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis (Indicaciones y resultados del neumotórax artificial en el tratamiento de la tuberculosis pulmonar) *Rev. Asoc. Méd. Argent.* 916 xxv 28

The authors treated altogether 35 cases of pulmonary tuberculosis by the Forlanini artificial pneumothorax method. Of these 15 were clinically tuberculosis and radiologically unilateral. The results are shown in Table I.

TABLE I

| | Inflamed | Casuous | Cavitory |
|--------------------------|----------|---------|----------|
| Cured | | | |
| Amoritized | | | |
| Stationary | | | |
| Interrupted in Treatment | | | |
| Dead | | | |

There were 20 cases which were clinically tuberculosis and radiologically bilateral. The results are shown in Table II.

TABLE II

| | Inflamed | Casuous | Cavitory |
|--------------------------|----------|---------|----------|
| Cured | | | |
| Amoritized | | 6 | 7 |
| Stationary | | | |
| Worse | | | |
| Dead | | | |
| Interrupted in Treatment | | | 3 |

The authors think that the Forlanini method is simple and easy. That it should be applied to patients whose lesions are manifestly active in one lung the other being healthy or only with a torpid

infiltration. Even when there is pleural involvement the method should be tried and in such case even a partial pneumothorax may cause a local and general improvement.

Favorable changes in the general state are immediate in the majority of cases. Cicatrization of the lesions must be slow. The method is innocuous and its indications should be widened and except in the cavitory forms a larger number of cures may be expected.

W. A. BRENNAN

Jessen, F.: Extrapleural Pneumothorax as a Method of Choice in the Treatment of Adherent Cavernous Tuberculosis of the Lungs (Ueber extrapleurales Pneumothorax als Methode der Wahl zur Behandlung adherenter kavernoöser Lungentuberkulose) *Zentralbl. f. Chir.* 1916 No 42

For those cases of tuberculosis of the lung in which owing to extensive adhesions between the parietal pleura and visceral pleura the formation of a pneumothorax is impossible the author recommends the formation of an extrapleural pneumothorax. It is merely the carrying out of the intrapleural pneumothorax to extrapleural territory. The results are so satisfactory that the method will compete with the intrapleural method of performing pneumothorax.

The operation is performed in case the adhesions prevent the formation of an intrapleural pneumothorax. Two ribs are resected over a cavernous area. With the aid of the X-ray picture the lung with its fascia endothoracica is separated bluntly from the thoracic wall bands of adhesions are clamped ligated and cut. The large cavity which is formed is sponged dry and a thick drain is applied for two days the cavity is kept dry with dressings or sponges but without any antiseptics. The important thing then is to leave the wound open so that the atmospheric pressure of the lung and of the extrapleural cavity is the same. It is therefore necessary to keep the cavity open as long as possible. If the lung is considered cured the wound or cavity is allowed to heal and close up. If the wound is closed the atmospheric pressure in the lung gradually expands the lung. Immediately after the operation high fever sets in, due to toxins being forced out of the lung into the circulation. In general the course is similar to that following pneumothorax.

Contrary to the large plastic operations this operation is almost entirely without shock and the action of it is much more intense than that following the plastic operations on the ribs, which is satisfactory only if extensive resection of ribs is done.

The method demands a certain consideration and experience but its action is so certain that the author deems it the method of choice for pulmonary cavities of tuberculosis.

Combinations with incomplete intrapleural pneumothorax are self evident.

In one patient on the eighth day after the operation a cavity burst into the wound. No serious consequences followed. After a few days of high fever the mechanical removal of the secretion (drying of the secretion and of the cavity) sufficed to bring everything to normal. It was shown that neither irrigation, antiseptic powders, iodine, thermocautery are necessary in fact they irritate and that the best procedure is to dry the cavity with sterile gauze whenever necessary. The patient made a splendid recovery. L. A. J. VAN

HEART AND VASCULAR SYSTEM

Lohligroel Shrapnel Bullet Free in the Left Ventricle with Recovery (*Naturgeschichte der Schrapnellkugeln im linken Ventrikel*) *Bull Acad Med P* 9 6 1 11 374

A soldier who had been wounded several months previously was sent to the author to ascertain the condition of his lungs and to locate the bullet which was believed to be in his breast.

Under the radioscopic screen the presence of the bullet in the cardiac area was immediately noted. It was seen to be free in the left ventricle and its movements corresponded with each cardiac pulsation, at the end of the diastole the bullet rested on the lower border of the heart near the apex, then at systole it moved rapidly from left to right. Following the left border it evidently came in contact with the intraventricular partition. At the end of the systole it descended again slowly to its old position. A. BRENNAN

Martinez, P., and Correas, J. N. Treatment of Wounds of the Heart (*Tratamiento de las heridas del corazón*) *Report of med* Bogota, 9 6 11 335

In commenting on a case of heart suture recently reported by Rico the authors report a similar case operated upon by them in 1910 and which was completely reported at that time. The case was that of a man about 25 years who had received a precordial wound about three hours before coming to the hospital. Pallid visage, small pulse, and difficult respiration suggested internal hemorrhage. There was a transverse external wound of about 2 cm. in the third left intercostal space about 6 cm. from the median line. Slight occasional spurts of blood corresponded to the respirations. A pleural effusion was indicated. Immediate operation was performed under chloroform. After section of the third, fourth, and fifth costal cartilages, the third and fifth ribs were denuded and divided by costotomy. The intermediate rib fractured, and the internal mammary artery clamped. The pleural cavity was found filled with blood. The wound was observed in the anterior wall of the pericardium whence the blood issued from the pericardium to the pleura. The pericardial wound was extended, the sac cleaned and emptied and through the myocardial wound there was clearly observed

bright blood spurting intermittently coincident with the systole movement. This wound, about 1.5 cm. long was situated on the left ventricle in the upper part. The operator's left hand was slipped behind the heart and seizing it firmly he drew it out of the pericardial cavity and rapidly passed a suture through the edges of the wound. The heart was felt relaxing and its beat ceased. Quickly replaced in its cavity the heart again contracted and the hemorrhage diminished. This maneuver was repeated a second and third time until three sutures were placed and the hemorrhage entirely stopped. This was followed by suture and drainage of the pericardium about 3 liters of blood were removed from the pleural cavity. The lung was not involved. The wound was closed. The whole operation lasted about half an hour. The condition of the patient was satisfactory for some time after the operation and the pulse became good. In the evening of the following day his condition became serious there was considerable dyspnea and accelerated pulse with meteorism and oscillations of the temperature from 37 to 40. He died about 30 hours after the operation, the symptoms being intensified.

Autopsy showed that the sutures remained firm and the heart wound was becoming cicatrized. The autopsy findings did not clearly establish the mechanism causing death. It can hardly be attributed to infection phenomena. The medicolegal verdict was that it was due to the large quantity of blood lost before operation. W. A. BRENNAN

Rothfuchs Suture of the Heart (Herznaht) *Deutsche Med Wochenschr* 9 6 211, 1086.

The author relates the case of a man who had attempted suicide by stabbing himself in the heart region with pocket knife. When he was received in the hospital one and one-half hours later he was unconscious, had no pulse, breathing difficult and irregular. There was a stab wound 2.5 cm. deep in the fifth intercostal space. Cardiac dullness was not ascertainable on account of pneumothorax. There was but slight hemothorax and no anuria.

The pericardium was laid bare and on the removal of blood-clots, etc., a stab wound about 2 cm. long was seen in the right ventricle. With each heart beat a jet of blood issued through the wound. The wound was sutured, the pericardium cleaned and completely sutured. During operation the pulse improved and at its completion the patient regained consciousness. The pulse gradually became regular and vigorous, the beats oscillating between 86 and 110. On the second day a bronchopneumonia developed in the right lung and the patient died on the following day.

With regard to technique Rothfuchs says that in this case owing to the difficulty of approaching the heart wound on account of the hemorrhage he put a catgut suture in the heart apex and lacerated the heart which facilitated the suturing of the wound. W. A. BRENNAN

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Sheffield H B : Tuberculous Peritonitis in Young Children. *Am. Med.* 1916 xi 709

Owing to the frequency with which abdominal enlargement is met in young children especially as a result of dyspepsia and rachitis it is not at all uncommon to find quite a large number of cases of tuberculous peritonitis which were overlooked until they reached very advanced stages. This is very unfortunate, since tuberculous peritonitis if treated surgically early is practically curable.

Judging from the fact that among the 46 cases under the author's observation 9 were under two years of age Sheffield is inclined to believe that a great many infants succumb to this disease before a correct diagnosis is arrived at.

Tuberculous peritonitis in young children is most apt to be confounded with rachitis anemia pseudoleukemia infantum, sarcoma of the kidney and primary familial splenohepatomegaly. Owing to the frequent coincidence of tuberculosis and rachitis in babies, the differential diagnosis between the two affections presents considerable difficulty. In such cases a positive tuberculin reaction is decisive in the diagnosis. EDWARD L. CORNELL.

GASTRO-INTESTINAL TRACT

Moschcowitz, A. V. : Massive Hemorrhages from the Stomach Without Demonstrable Ulcer. *Am. J. M. Sc.* 1916 cii, 714.

A typical example of exulceratio simplex Dieulafoy can be said to have only one well marked symptom namely profuse hæmatemesis. This is such a characteristic symptom that we may divide the entire symptomatology into two parts (1) before and (2) after the occurrence of the hæmatemesis.

Before the occurrence of the hæmorrhage the history and physical signs are to all intents and purposes negligible. We find in a majority of instances that the afflicted individuals have no complaints referable to the stomach. The appetite and digestion are fair and the general health is so good that there does not exist at any time suspicion of impending danger. Suddenly and without any warning the patient vomits blood. It is rather characteristic that the first vomiting is so profuse that the patient shows systemic signs of bleeding. There are cases recorded in which even the first hæmorrhage was fatal.

The physical signs before hæmorrhage are not known, for obvious reasons, but in view of the absence of symptoms before hæmorrhage it is safe to assume that the physical signs must also be negative.

After hæmorrhage has taken place the symptoms and physical signs which govern the disease are merely those of a profound anemia. Examination

of the stomach reveals nothing noteworthy. In the few cases in which the gastric contents were examined nothing characteristic has been found. In some cases a marked hyperacidity in some normal values, and in others even a hypo-acidity has been found.

The disease affects most frequently females in the early twenties but males in the later years of life and even children are not immune.

The author reports four personally observed cases all of them seen within a period of less than one month and three within a period of two days. In all of them he had made, or at least concurred in the diagnosis of a bleeding ulcer of the stomach or duodenum. In all cases the abdomen was opened but no evidence of ulcer found. In three cases the stomach was not opened. In one a posterior retrocolic gastro-enterostomy was performed with exclusion of the pylorus. Two cases had a stormy convalescence but all recovered.

EDWARD L. CORNELL.

Hartert, W. : A New Method for Obtaining Complete Asepsis at Stomach and Bowel Operations (Eine neuer Weg zur Wahrung vollkommener Asepsis bei Magen Darmoperationen). *Beitr. z. Klin. Chir.* 1916 xcix 475

Even though the peritoneum possesses resistance against mild infection and even against severe infection there are nevertheless many fatal cases of peritonitis attributable to infection originating at operation upon the bowel. Furthermore, infection of the bowel can lead to postoperative ileus, postoperative pneumonia or pleurisy postoperative adhesions giving way of sutures abdominal wall abscesses etc. On that account complete asepsis at operation is desirable. Many methods for the accomplishment of this ideal have been devised, but critical examination of the methods shows that only a few of them come up to requirements completely. First, the two-stage procedures in which the opening of the anastomosis is done some time after the primary operation have such limited application that their practical value is much decreased. Second, those methods employing the thermocautery can be called aseptic therefore the methods of Rostowzew and Moskowitz may be considered aseptic. Contrary to this all methods opening the bowel cold must be considered as not aseptic.

The author has worked out a method which consists in boiling of the loop of bowel to be opened opening and suture in boiled tissue and invagination of the boiled loop. Experimentally a loop of bowel was covered especially with pus and a bacterial culture then clamped with tin clamps through which a stream of steam was forced. After boiling 15 to 30 seconds all bacteria were killed. Furthermore experiments on the cadaver showed

that suture of the boiled bowel wall showed no changes in comparison with the normal bowel wall.

To accomplish this the author invented an instrument which would save the maximum amount of space yet permit the following: (1) rapid and certain boiling of the bowel, (2) limiting the boiling to the part desired, (3) closure of the boiled loop of bowel from the adjacent bowel, (4) certain avoidance of burning contiguous organs. This was accomplished with the author's instrument.

Aside from the undesirable atrophy of the bowel boiling causes a certain loss of firmness and elasticity of tissue but not sufficient to hinder the careful application of a good suture provided the bowel is not compressed too tightly. Shrinkage of the bowel is prevented by cooling the loop before removing the clamp.

The technique of suture or union of the bowel in boiled tissue is different from others in that the through and through suture passes through boiled instead of normal tissue and that instead of only one seromuscular suture being applied two are used, as the through-and-through suture is only temporary and has served its purpose when it is extruded with the necrotic portion.

The author's conclusions are: (1) In the employment of the principle complete asepsis is ideally retained. It is absolutely certain that not a single living bacterium is able to reach the abdominal cavity from the bowel. (2) All typical operations necessitating the opening of the bowel or stomach can be performed aseptically. (3) The possibility of hemorrhage post operation is absolutely excluded. (4) Side injuries are avoided by the protective cooling apparatus. (5) The anastomosis openings produced with this method are large and secondary contraction need not be feared. (6) The sutures are applied in sterile tissue and stitch infection will not occur. The inner row of sutures is protected for some time after the operation. (7) By employing the method the bowel may be severed several times in the sterile segment if severing will permit greater access to parts as no infection need be feared.

The method is less adapted to narrow bowel parts, in end-to-end anastomosis of a distant part to a narrow terminal part and in places where room is scarce, as in high stomach resections. It is especially adapted however to the large bowel on account of the high bactericidal content. L. A. JONES.

Gewin, B. C. Gastrocolic Fistula Due to Chronic Gastric Ulcer; Spontaneous Cure. *Ann. J. R. Med.* 9 6 1914, 304.

In the case reported there was a definite history of gastric ulcer and under the fluoroscope burnish was seen to pass through a fistulous opening in the posterior wall of the stomach. The logical conclusion was that the fistula was between the stomach and the colon. At the same time food passed through the pylorus into the duodenum. Under treatment there has been a great increase in weight

with complete amelioration of digestive symptoms, and apparently the ulcer healed and the fistula closed. Possibly healing was facilitated by the increased blood supply to the ulcer through the attachment of the affected area to the colon.

The chief cause of these fistulae is nearly always a gastric affection carcinoma or ulcer the principal symptoms being fecal vomiting or the eructation of fecal gases, without other signs of intestinal obstruction diarrhea loss of weight. Ability to inflate the stomach through the rectum is also occasionally noted, as well as the vomiting of enemata, the withdrawal by gastric lavage of colored fluids introduced into the rectum, and the finding of pepsin and hydrochloric acid in the stools are also diagnostic aids. L. K. AXENSTROM.

Pauchet, V. Treatment of Chronic Ulcer of the Stomach (Traitement de l'ulcère chronique de l'estomac). *Pres. Méd.* 19 6 p. 445.

Pauchet thinks that the treatment of choice in cases of gastric ulcer is not gastro-enterostomy but resection. For ulcers situated on the small curvature Pauchet recommends segmental gastrectomy done in the following stages:

1. Colo-epiploic exposure.
2. Section of stomach more or less near the duodenum according to the situation of the ulcer.
3. Section of the stomach above the ulcer.
4. Closure of the gastric end on the duodenal side.
5. Gastrojejunal implantation as in a resection for cancer.

For hour glass stomach resulting from cicatricial ulcer the author resects systematically the same as for an ulcer of the small curvature.

For perforated ulcer if treated within the first few hours the operation of choice is suture of the ulcer consolidated with fragments of epiploon. Such a procedure is impossible when the ulcer is extensive and its edges rigid. When such is the case gastrectomy is indicated. W. A. BRECKMAN.

Hortolomey, Personal Modification of Wilms' Method for Pyloric Exclusion (Modificación personal del procedimiento de Wilms para la occlusión del píloro). *Rev. d. med. y pract. Madrid* 9 6 21, 34.

As the result of a series of experiments made on dogs Hortolomey has succeeded in modifying Wilms' method of excluding the pylorus. While the method by section and complete separation of the pylorus from the stomach provides complete and definite exclusion it has the disadvantage that it prolongs the operative act and there is the danger of peritoneal infection by manipulation of the sutures of the rancosa. The mortality is relatively high and the procedure is very dangerous for debilitated patients. Simple procedures, stoppage and ligature of the pylorus give imperfect results. The exclusion is temporary and after a time the pylorus is again permeable. By Wilms' method the exclusion is obtained by means of ligature, using a small strip

taken from the sheath of the rectus muscle fascia lata, epiploon, etc. While this gives a ready occlusion, after more or less time — not exceeding three to five months — the pylorus again becomes permeable due to two causes. Some aver that the peristaltic stomach movements separate the strip and others that it is distended by the muscular force of the fleshy coatings of the stomach which propel the stomach contents toward the pylorus and overcome the resistance of the strip.

Two animals on which Hortolomey did a Wilms operation were sacrificed after 93 and 103 days respectively. Water introduced by the cardia escaped both by the pylorus and by the artificial gastro-enterostomy. Hortolomey believes that the insufficiency of the pyloric exclusion may be explained thus. When the pylorus is compressed by the aponeurotic strip the stomach mucosa forms a series of longitudinal folds which come in contact with and obstruct the conduit. In time owing to the pressure exerted on the pylorus by the stomach contents the mucosa atrophies and the folds are effaced. The stomach contents then begin to pass more and more abundantly and finally overcome the resistance of the strip. Separation never takes place.

Hortolomey's modification of Wilms procedure is effected as follows: (1) After cleavage of the gastrophagic and great epiploon the finger is introduced beneath the pyloric antrum and the serous membrane is incised around it by the bistoury and the muscular coat as far as the mucosa, dissecting it to the extent of 1 to 2 cm. (2) With a Kocher's forceps introduced below the posterior face of the antrum, the aponeurotic strip is seized and applied. Another forceps holds the other extremity of the strip. The ends are crossed over and tied with a thread passed through the strip. (3) A seromucosal suture is made all around superficially so that the strip is completely buried. The gastro-enterostomy is then carried out in the classic way.

The author states that the reasons on which his modifications are based are: (1) that by applying the strip upon the mucosa complete occlusion of the pylorus is secured, (2) that the strip remaining between the coats of the stomach there is produced in its neighborhood a slight extravasation of blood and therefore the gastric coats behave toward it as in the case of a foreign body newly introduced and effect a solid cicatrization between the stomach walls and the strip like that produced in an ulcer or in a fibrous stenosis of the uterus. In animals on which this procedure was done and which were killed after about eight months the occlusion was found to be definite in all. The pyloric orifice was found completely obscured and atrophy was observed on the pylorus alone. Externally to the pyloric site there were no adhesions. The procedure has also been carried out in two patients of Hortolomey's clinic: one with duodenal and the other with pyloric ulcer. The operation was well borne and the results excellent.

Hortolomey claims these advantages for his

method: (1) there is no increase in the duration of the operation; (2) definite occlusion is obtained; (3) by suturing the aponeurotic strip the ultimate formation of adhesions between it and the immediate organs is avoided; (4) its results are definite and the patient is less exposed to the danger of peritoneal infection.

W. A. BRENNAN

Crispin, E. L. Duodenal Ulcer with Achlorhydria

Internat. M. J. 9 6 xliii 890

This article is a brief review of the history of eleven cases in the Mayo Clinic of operatively proved duodenal ulcer in which the gastric analysis showed an absence of free hydrochloric acid.

Ten of the eleven patients in this series were males. The one female aged 37 was the youngest. The oldest patient was 66. The average age was 54 years. Four of the patients had used alcohol moderately, i. e. 1 on a basis of 0 to 4. Seven had been moderate users of tobacco. In no case was there history or evidence of syphilis. In all there was weight loss, the greatest being 94 lb., the least 5 lb., and the average, not counting the very excessive loss of 94 lb. in one case, 15 lb.

It is interesting to note that, as regards previous illnesses, four of the patients, or 36 per cent., had had typhoid fever on an average of 24 years before. Of the patients 3 had had abdominal operations in the appendix had been removed eight and six years before respectively. The third patient had been operated on for gall stones four years before stones were not found, the gall-bladder was drained and the appendix removed. All the patients had pain or distress. The time of pain or distress was variable, beginning from one-half to four hours after meals. Night pains were recorded in three instances. Nine patients gave a history of vomiting varying in character from hot sour water to delayed vomit. Two patients had hæmatemesis. Nine complained of gas, belching and bloating. Eight were constipated, three had had diarrhoea and three reported blood from the bowel.

In none of these cases was free hydrochloric acid found in the gastric content. The lowest acidity was 4-0-4, the highest 38-0-38 and the average 15-0-15. Food remnants from the evening meal were withdrawn with the test breakfast content in 6 of the cases. The largest amount of retention was 1,200 ccm.

In operating on these cases of duodenal ulcer it was found that 1 was associated with empyema of the gall-bladder, 2 had perforated, in 3 there were also gastric ulcers, in two instances on the posterior wall and in one on the lesser curvature. In 5 cases there was no disease in the upper abdomen other than the duodenal ulcers. In 6 of the cases marked obstruction of the duodenum was found at operation. In 1 there were two ulcers on the anterior surface of the duodenum. In 3 of the 11 cases the appendix was removed at the time of operation. Because of the ulcers a gastro-enterostomy was done in all.

EDWARD L. CORNWELL

Boughton G. C. *Intestinal Stasis. Internat. J. Surg.* 1916 xvi 359.

Intestinal stasis is due to retention for too long a time of bowel contents with resulting toxic absorption and the production of quite constant and definite symptoms. The adoption of the upright posture by man has been followed by descent of the heavier abdominal viscera, more marked in some regions than in others with the consequent production of kinks leading to some degree of intestinal obstruction. The situations at which kinks are especially liable to develop are the third portion of the duodenum, the lower end of the ileum, the appendix, the hepatic and splenic flexures and the sigmoid.

Duodenal kinking is usually secondary to dropping of the lower end of the ileum and is not permanent. The mechanical consequences are distention, congestion and ulceration. In kinking of the lower ileum demonstration of a fixed point indicates the presence of a Lanza kink. Involvement of the appendix by bands is often followed by inflammation, but in severe cases where displacement of the appendix is associated with kinking of the ileum removal of the appendix fails to relieve the symptoms. In the hepatic region obstruction much less common but the effect of slight diminution in the caliber of the gut is far greater here. As the splenic flexure is normally firmly fixed there may be a very long rise from the dropped ascending and transverse colon, and feces may be retained for days in the latter organ. The sigmoid is frequently the seat of adhesions which result in the formation of narrowing kinks, diverticula or lengthening.

The important parts of the treatment consist in the use of good hygiene, diet, tonics and a pure liquid paraffin or Russian oil. In case progression to a stage of chronic intestinal stasis occurs, despite careful medical treatment it becomes necessary to perform a laparotomy for the purpose of removing bands and straightening kinks. L. E. ASSOCI.

LIVER, PANCREAS, AND SPLEEN

Neugebauer F. *An Insect in the Gall Bladder. Zentr. blatt. Chir.* 1916 xvi 4.

The migration of foreign bodies from the intestine into the common duct and thence into the gall bladder has occasionally been reported. In a woman of 43 with gall bladder symptoms operated upon by Neugebauer a large number of small calculi with purulent bile were found in the gall bladder and among the calculi was found insect 8 mm. long. This was zoologically recognized as a larva of the forficula auricularia, a common enough insect which can easily reach the human digestive tract with foods such as salads and fruits.

The insect was certainly dead when it reached the duodenum. The matter for discussion therefore is of the penetration of dead insect from the duodenum into the gall bladder.

Apart from the curious finding Neugebauer thinks

the incidence is of interest in the pathogenesis of bile passage disturbances. It demonstrates the possibility that particles of the intestinal contents can possibly reach the bile passages, such particles may be so small as to escape detection.

W. A. DREXMAN

Shaw H. A.: *Surgery of the Gall Bladder and Biliary Passages. Internat. J. Surg.* 1916 xvi, 390.

In discussing the physiology and embryology of the biliary system Shaw dwells especially upon the intimate association of the mechanics of the pylorus in relation to that of the gall bladder. He also emphasizes the chemical change which the bile undergoes during its sojourn in the gall-bladder, particularly in reference to the immense amount of mucus which is added and the great importance of this substance as the natural protector of the duodenum in addition to neutralization of the acid chyme and other proved and accepted facts in relation to the physiology of the bile.

The above facts are utilized to establish the author's contention that the protective rôle played by the mucous secretions, more especially in the upper intestinal tract, is much greater than is usually considered.

The importance of stasis as an etiological factor in biliary infection is emphasized as follows: "When we consider the bile as a culture medium for certain types of organisms, especially the omnipresent coliform group, we can readily realize that any mechanical interference with its proper exit from the gall-bladder (culture tube) would mean a rapid bacterial growth. For the sake of brevity and lucidity he constructs formula as follows:

Bile + Micro-organisms + Stasis = Inflammation.

Inflammation = $\begin{cases} \text{Cholecystitis.} \\ \text{Cholelithiasis.} \\ \text{Empyema.} \end{cases}$

The theory of Rosenow in reference to the selective action of certain organisms, etc., is not wholly accepted by the author, claiming that the severity of the resulting inflammation depends, first upon the degree of stasis and second upon the nature of the infection.

Under operative technique he calls attention to the fact that anatomically it is well to remember that the thoracic nerves innervate the abdominal parietes and are in the same relation to the linea transversae as to the rib, drawing practical deductions therefrom in reference to abdominal incisions.

As regards the treatment of cholelithiasis the following practical suggestions are offered:

1. Perform the minimum amount of work absolutely necessary.

Carefully ligate every tiny bleeding point.

3. Use the most scrupulous care in applying both tension and coaptation sutures. Use 50 per cent more sutures and use non-cutting needles,

pulling the sutures tight. Apply silkworm gut tension sutures in figures of eight, making the lower loop include the posterior sheath of the rectus, and tie tightly over gauze with a bowknot, so that they may be tightened later if necessary.

4. Absolutely eliminate dead space.

5. If time will permit give 1 gm. dose of calcium chloride every three hours for at least one day before the operation and use postoperatively by proctodysis (drop method) 4 gm. to the liter.

6. Inject horse serum (if not obtainable use anti diphtheritic serum) intramuscularly at the time of the operation and repeat if necessary. (The author has injected it locally into the wound with negative results.) The danger of anaphylaxis is greatly overestimated and in a critical case should be given scant consideration.

The author reviews the similarity of the symptom-complexes in the various lesions of the gastrointestinal canal and especially emphasizes the absolute necessity of careful case histories to fortify our operative judgment. He gives the technique of exploration in cases uncomplicated by adhesions and in cases complicated by adhesions. Under exploration the subject of re-formation of gall stones is considered with the following conclusion.

The prophylaxis against the re-formation of gall stones is to remove them all at the time of operation. The coincidence of pelvic lesions with gall stones is noted, especially in obese subjects wherein adequate and proper manual examination is often impossible and the necessity of routine pelvic exploration is urged.

In discussing examination of the gall bladder the author calls attention to the value of deduction arrived at in testing the elasticity of the gall bladder wall and to the value of the transmitted impulse to the point of obstruction obtained by alternate compression and relaxation.

In discussing the various problems presented in the treatment of adhesions in connection with proper exploration the author emphasizes the importance of careful history taking goes into the question of crippling defects and the inevitable re-formation of adhesions. He takes into consideration the patient's general physical condition and the question of shock following trauma in this particular region, etc. In regard to the indiscriminate breaking up of adhesions he quotes the old axiom: "Fools rush in where angels fear to tread." In the treatment of adhesions two suggestions are offered: sharp dissection and colohepatoxy.

In considering the choice of operation the author emphasizes the important rôle played by the gall bladder both from the standpoint of embryology and physiology. Unlike the appendix the gall bladder is not simply the rudimentary remains of a once useful organ but rather the development of an organ called into being by sheer physiological necessity. He claims that dilatation of the common duct following cystectomy rather proves than disproves the above point.

He dwells upon the indications for cystectomy pro and con and especially emphasizes the importance of structural defects, productive of biliary stasis and all of its attendant evils. He cites the stenosing irreparable injuries following common duct drainage or the necessity of depending upon the tiny ampulla of Vater for the same in cystectomy where there is a coincidental cholecystitis. Some of the statements are at variance with the conventional ideas. Shaw claiming that in conditions involving the common duct and calling for drainage of the same it is often conservative as well as good surgery to utilize even a damaged gall bladder for drainage provided the cystic duct is sufficiently patent to freely permit this, citing at the same time the innumerable instances that the gall bladder had remained symptomless and apparently functionally normal after cystectomy was performed preliminary to cystectomy.

He states that where incision of the common duct is rendered necessary by the presence of stones, for the purpose of adequate exploration, etc. the immediate suture with drainage externally to the lumen, associated with cholecystostomy offers: (1) lower mortality (the mortality rate is high in all common duct operations) (2) far less permanent injury to the duct, and (3) equally perfect drainage provided there is an amply patent cystic duct.

The conclusion as to operative choice is. Generally speaking the lesions calling for cholecystectomy rather than cystostomy are those wherein the mechanics of the gall bladder and cystic duct are permanently altered—lesions that tend toward biliary stasis. Under operative technique he suggests that if one would realize the full value of rotation of the liver this should be attempted before packing is placed to such a degree as to interfere with free rotation.

The first fold of the lap roll is gently inserted into the foramen of Winslow thereby blocking the same and preventing any possible contamination of the lesser peritoneal cavity at the same time assisting in retaining the gauze in proper position. He cautions against freeing any more of the fundus of the gall bladder from the liver than is necessary to do a proper inversion around the tube, for the reason that the visceral peritoneum of the liver is the natural support of the gall bladder and holds it at such an elevation as to favor proper drainage and prevent any angular deformity or collapse or adhesion to the structures below. Incidentally while touching upon the normal supports of the gall bladder and the participating of the liver in the respiratory excursion, the author recommends that where there is a long redundant fundus coupled with a gall-bladder of abnormal capacity the excessive portion should be amputated by crushing along the proposed line of amputation with a small Payer clamp thereby greatly diminishing hemorrhage after which cystostomy is performed in the usual manner.

He condemns the practice, which is not at all unusual of fixing of the tube that drains the gall-

bladder to the abdominal wall. He considers this bad practice for the following reasons: (1) It does not allow for the natural mobility of the liver which assumes a somewhat different position according to the posture of the patient. (2) It fixes the tube at two moving points, i.e. the abdominal wall and the liver. (3) The abdominal suture is applied after the wound is closed either dragging the gall bladder upward or forcing it down in an untoward position.

The importance of Monson pouch need a vantage point for drainage extra to the gall bladder this is dubbed as an anatomical catch basin and the author urges drainage of the same in all cases. He believes that many of the poor results following cholecystostomy are due to insufficiently prolonged drainage. The primary object of the operation is to insure a free outflow of bile coming away clear.

Alex. Bryan Johnson claims that it is important to lead the drainage tube from the upper angle of the wound. Shaw takes exception to the procedure as routine, believing that the drain should be brought out at that point which does not agitate the bile or press upon the margin of the liver thereby interfering with the normal mobility of the liver.

His conclusions as to the desirability of dropping the gall bladder back into the abdomen without suturing to the parietes are that as preoperative findings and symptoms are deceptive and biliary stasis and not the character of the infection is the true index to the severity of the lesion where mechanical conditions are perfect a properly placed drain extra to the gall bladder is the keynote of safety and not the suturing of the focus to the parietal peritoneum with all of its attendant evils, too well known to call for remarks.

As regards cholecystectomy he is of the opinion that the anatomical facts in relation to this operation show that individual ligation is not only extremely desirable from the viewpoint of good technique but easily accomplished in 75 per cent of all cases and that ligation en masse is irrational and consequently obsolete except in about 25 per cent of cases, where adhesions have produced great anatomical distortion in which cases he resorts to ligation en masse and does not attempt to ligate flush with the common duct, preferring to disregard the advice of Crile and take the chance of a possible sacculation and inflammation of the remnants of the cystic duct and consequent trouble (remotely possible) rather than risk the injury to the common or hepatic duct.

Shaw states that in over fifty careful dissections he has demonstrated to his complete satisfaction that the ideas of Pels-Leusden in reference to the cystic artery are absolutely correct and that any technique based upon the intimate relation of the cystic duct and artery near the confluence of the cystic with the common duct is basically wrong stating:

Here again I wish to repeat that except in a small percentage of cases we can not expect to grasp the

cystic artery and duct in the same bite unless we include such amount of tissue that will endanger the hepatic (especially the right) or the common duct.

I regard to the attachment of the gall-bladder to the liver he does not accept the unchallenged and time honored statement that the gall-bladder frees easily from below upward he claims that it is immaterial.

He describes his technique of cholecystectomy and sun marvels at advantages as follows:

1. Individual ligation of the cystic artery.

2. Ability to straighten the cystic duct and thereby safely free it up to its confluence with the common duct in that way leaving no stump for future trouble.

3. There is no crushing or tying in the dark even though the gall bladder is in plain sight thereby minimizing the danger to the biliary ducts.

4. It is practically bloodless and with the artery tied at the beginning and the duct well exposed any hemorrhage of the liver would not mask the field.

5. There is no perfect and complete peritonealization.

6. The duct being severed as the final step, prevents the possibility of septic contamination.

Under cholecystenterostomy the author draws the following conclusions:

1. It is absolutely necessary to make sure that the cystic duct is competent before attempting operation.

It is most desirable to have a gall bladder not too seriously pathologic i.e. one capable at least of assuming and continuously maintaining a tubular function.

2. Anastomosis with the colon should have no place in surgery of the gall bladder. The inevitable infection of the biliary apparatus and the continual absence of bile in the small intestine spell death.

3. Anastomosis with that portion of the duodenum above the ampulla is far better though more difficult of accomplishment than with the jejunum by the retrocolic method is ideal from a physiological standpoint. It is the method of choice in all non-malignant conditions where a permanent stoma is considered. (The special indications are the non-malignant obstruction of the lumen of the choledochus not removable by choledochotomy or stenosing injuries following choledochotomy.)

4. Anastomosis by the retrocolic method with the jejunum is beset with less operative mechanical difficulties. It should be adopted in all cases where anastomosis with the duodenum is impossible through adhesions or other causes. It is the method of election in all malignant conditions. (In malignant obstruction the relief is of necessity only temporary and great speed is essential.)

5. By either method it is absolutely essential to establish a liberal stoma. Infection is more to be feared than the entrance of food into the gall bladder. A liberal stoma provides good drainage and insures against subsequent contraction.

7 All added operative procedures such as an anastomosis of afferent to efferent gut by the method of Milkulicz, etc. to prevent passage of food into the gall bladder are simply added dangers and of doubtful utility.

8 As in cholecystostomy or cholecystectomy drainage of Morrison's pouch is essential with the added precaution of not allowing the drain to come in contact with the suture line.

Starr F N G: Differential Diagnosis of Gall Stones and Their Treatment *Internal J Surg* 1916 xxiv 346

Remembering that about one in ten individuals that come to autopsy show gall-stones and that stomach symptoms are usually reflex, will result in overlooking fewer cases of cholelithiasis. The symptoms vary from those characteristic of the affection to the indefinite manifestations often seen. Cases presenting attacks of dull epigastric pain often aggravated by taking food, some tenderness on pressure under the right costal margin discomfort increased by deep inspiration associated with such symptoms as nausea and loss of appetite are difficult of diagnosis.

Gall-stones must be differentiated from pleurisy, appendicitis, right kidney trouble, pancreatic disease, gastric and duodenal ulcer and cancer of the transverse colon. Sufferers from gall-stones are often subject to rheumatism, neuralgia or sciatica, the gall bladder being sometimes the source of infection when other organs more commonly at fault are negative.

The treatment is surgical, with the following objects to be attained: improvement of the patient's health, avoidance of impaction with its complications, avoidance of infection with its sequelae because of the possibility of the development of carcinoma in the irritated gall bladder. In cases where the mucous membrane presents a diseased appearance and where infection is prone to persist in the submucosa a cholecystectomy should be done.

E. K. ARMSTRONG

Giovanni O. An Unrecognized Symptom in Lesions of the Pancreas and in Aneurisms of the Coeliac Artery (Su di un sintomo sconosciuto nelle lesioni del pancreas e nell' aneurisma del tronco celiaco) *Gazz. d. osp. Milano* 1916 xxxvii 948.

Hepatic colic with icterus generally suggests the diagnosis of biliary lithiasis, especially when there is accentuated pain on palpation over the gall bladder; however the picture does not always correspond to biliary lithiasis but is an indication of other lesions in the vicinity of the liver.

In a case coming for operation to the author with diagnosis of cholelithiasis he was able to observe by palpating along the liver and gall bladder that there was an abnormal pulsation with a sensation of friction which was rendered more distinct and evident on applying the stethoscope

about a fingerbreadth to the right of the umbilicus—a sensation which is evident neither in normal subjects nor in patients with biliary lithiasis. On proceeding to operation in this case the gall bladder was normal but there was a hard tumefaction involving the head of the pancreas and an augmentation of the whole organ.

In another case with similar symptomatology and in which he was also able to demonstrate the abnormal pulsation referred to there was found on operation an aneurism of the coeliac artery.

Therefore the author thinks that the phenomena of hepatic colic with intermittent icterus may occur otherwise that when directly dependent upon lesions of the common duct and gall bladder they may be caused by pathologic conditions of neighboring organs producing compression on the hepatic duct. Also that when in hepatic colic and intermittent icterus the abnormal pulsation at the right side of the umbilicus can be demonstrated it is a question either of a lesion of the pancreas or an aneurism of the coeliac artery. W. A. BRENNAN

MISCELLANEOUS

Fischer L.: Notes on the Diagnosis of Abdominal Distention in Children. *Med. Rec.* 1916 xc 933

Abdominal distention is met with in many chronic conditions as in Hirschsprung's disease, tuberculous peritonitis, malignant neoplasms involving the kidney, hepatic cirrhosis in which the abdomen is uniformly distended and extremely tense in Banti's disease in tuberculosis of the mesenteric glands, severe rickets, in Pott's disease in conjunction with hydropneumothorax and in diseases of the ovaries and uterine adnexa. None of these conditions lead to an immediately fatal termination.

The acute conditions are of greater interest and among the obscure causes of distention are typhoid fever, the classic symptoms of which are not so often noted in children, swelling of the mesenteric glands, overaction of the pyloric sphincter, pneumonia, obstructive and inflammatory conditions in the abdomen and rarer conditions affecting the bladder, ureters, kidney, liver and peritoneum.

In the diagnosis of acute abdominal distention a thorough examination is imperative. A leucocytosis of 20,000 or more indicates good resistance and is of prognostic value. A progressively increasing pulse rate indicates a progressive septic infection combined with an increasing leucocytosis it indicates the spread or intensification of inflammation. The lungs should always be inspected for consolidation and effusion.

A sudden illness in which abdominal symptoms appear should always be looked upon with gravity, careful consideration being given to such symptoms as persistent vomiting, singultus and abdominal distention, while the presence or absence of blood in the stool is very important in arriving at a diagnosis. E. K. ARMSTRONG

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Le Fort, R. Deep and Massive Contusion of the Lower Limb Intervention on the Perivascular Sympathetic (U syndrome de contusion profonde et massive d'un membre inférieur intervention sur la sympathique périscolaire) *Revue de la chirurgie* 9 6 1937

In the case of a man injured by the fall of a mass of earth in a mine explosion the facts noted by the author were first an enormous swelling of the limb apparently due to a deep formidable hematoma. This appeared to subside with a dozen days and was followed by contraction in the flexion of the thigh and knee and also in the amount of rotation of the limb. This in turn was followed by atrophy of the muscles and the indurations persisted in the muscular masses for many months accompanied by an absolute impotence of the limb and foot. Spontaneous pain was fairly constant and acute pain was felt at the least pressure in the lower extremity.

From his study of such cases and noting the failure of other methods to check the persistence of the symptoms the author decided that active surgical intervention of the perivascular sympathetic system was indicated. The sympathetic plexus was reached by the popliteal route. Intervention was made under fluoroscopy. The artery and vein were cleared from their coverings for about 6 cm. of their extent. The dissection was delicate on account of adhesions of the sheath to the artery. The results were good the melioration being rapid and progressive. The patient was able to be up within a few weeks. *W. A. Bax*

Finkelstein H. Joint Hypotonia. *N. Y. M. J.* 19 6, 4 942.

The author describes a unique case characterized by a striking degree of joint mobility involving practically all the joints of the body without apparent demonstrable muscle weakness. The case was that of a 21 months old girl whose grandmother two aunts and mother had had flail joints during youth. The child's joints had been flail since birth the upper and lower extremities being especially involved the spine to a lesser degree but the muscular power was unimpaired. The hips could be dislocated and replaced at will without much effort.

This case differed in nearly all essentials from Oppenheim's myotonia congenita. It was not only congenital but familial as well. There was no interference with the motor power not even a weakening of the muscles nor was there any loss of reflexes. The electrical reactions were normal. Nearly all the joints of the body were involved. The radiographs showed no evident lesions of the

bones. The only structures affected were the capsules and ligaments of the joints. A favorable prognosis was based on the progressive improvement which occurred in the other members of the family similarly affected. *Philip Lewis*

FRACTURES AND DISLOCATIONS

Cotton F. J. On Calcus Fracture. *I. S. J. Phila.* 9 6 1919 430

The author calls attention to the crushing character of fractures of the os calcis. Such fractures are not clean cut and any attempt to lateralize them is useless. The fracture is caused by a fall in which the patient lands on the heels. It is then considered in this paper. There is a smashing down of the spongy bone the posterior part is pushed up and the sides spread out especially the external side, causing an increase in width. The prominence of the displaced bony wall under the external malleolus, together with the upward displacement of the heel is regarded as a fairly constant sign of this fracture. Another important sign is the interference with lateral motion in the calcaneo astragaloïd joint. It is with supination and pronation of the foot. The usual method of treatment merely putting the foot in casts gives poor results and the patient is always more or less disabled. A more definite form of treatment is advised consisting in forcibly pulling down the heel and impacting the fracture by lateral pressure with pad and hammer under general anesthesia. Out of 2 cases followed up after conservative treatment 1 showed either complete or very marked disability with loss of lateral motion. Of 11 patients examined after treatment by the forcible impaction method good or perfect results were shown in 8 cases. *W. A. C. W.*

Collins, H. Coraco-acromial Dislocation. *Bull. Dept. P. M. Charles* 9 6 1934

Luxation of the outer end of the scapula may be either subacromial or supra-acromial the latter being the most frequent. Either type may be complete or incomplete depending upon the damage to the acromial ligament of the acromial articulation.

Reduction is usually easily accomplished but maintenance of the parts in proper position is often difficult and impossible. It may be accomplished however by passing a bandage under the elbow and over the coracoclavicular joint with a pad placed over the articulation but irritation is apt to occur if firm pressure is maintained for the necessary four weeks. Wiring the joint or the use of an absorbable suture material may be adopted but this has the objection of leaving a scar and it is used if often causes irritation if weight is borne on the shoulder. The author uses an ordinary carpenter's snubbing nail about four inches long. A hole is

drilled obliquely through the outer end of the clavicle so that it emerges on the articular surface of the bone as near the center as possible the hole should be the same diameter or a little smaller than the nail. With the dislocation reduced and held by an assistant the nail is driven through the clavicle downward backward and outward into the body of the acromion. A gauze pad is placed under the head of the nail to prevent ulceration of the skin. At the end of four weeks the nail is easily withdrawn and only a tiny scar at the point of entrance remains.

R. G. PACKARD

SURGERY OF THE BONES JOINTS, ETC.

Schwartz, A. and Mocquot P. Treatment of Injuries of the Articularia in the Ambulance (Traitement des plaques articulaires dans les ambulances) *Rev de chir* 1916 1 48

The evolution of wounds of the articulations varies from the greatest benignity to the utmost degree of gravity. Everything depends on infection. Aseptic or practically aseptic wounds recover with the greatest facility. It is therefore very important to be able to determine early the condition of the injury and to regulate the early surgical treatment accordingly. In the first few hours after injury it is very difficult to determine the even quality of infection; only in a gross way can one estimate the amount of substance from the ground clothing, etc. earned into the wound by the projectile, and the best evidence is drawn from the nature of the projectile itself. Experience has demonstrated that bullet wounds usually evolve as aseptic wounds. Irregular projectiles, shell bomb and grenade wounds are so frequently complicated by infection as to be considered almost fatal. The authors rule, therefore, in such wounds however benign they may appear and no matter what the volume of the projectile may be, is to remove the projectile at once.

In joint injuries in general the authors consider good drainage the prime necessity. In their interventions they limit themselves proportionately to the estimated degree of infection and of osseous lesions. In simple penetrating wounds without osseous injury they make an arthrotomy more or less wide followed by drainage but sometimes with out an actual drain. The dressing is simple. The articular fluid runs through the synovial opening for any time up to 36 hours and then the latter closes spontaneously. They have never completely closed the synovial breach by a suture.

Simple fissure injuries are treated in the same way. If there are numerous bony particles, but limited in their area they are extracted as well as the projectile when within reach.

When the articular surfaces are severely damaged the authors resect either partially or totally the resection being typical or atypical according to the case. In these operations they endeavor to preserve the periosteum, which not only limits the

extent of the operation but forms a barrier to infection by protecting the intramuscular spaces.

The most rigorous and minute asepsis is absolutely essential in all surgical procedures about a joint and if such are not assured no such operations should be attempted at the front. The thermocautery is freely used when the condition demands it to obtain a relative asepsis.

Regarding anesthesia for the upper limb a general anesthetic is used but for the articulation of the lower limb spinal injection of novocaine is found sufficient. In cases of extensive hemorrhage or in men weakened by infection or profoundly depressed by traumatic shock such local anesthetic may fail.

After intervention the joint must be rigorously immobilized. The authors consider in detail the indications for amputations, etc. and describe a large number of cases illustrative of injuries of particular articulations which they fully discuss.

W. A. BRENNAN

Thomas, J. L. Emergency Amputations in Military Surgery. Simple Modification of Guillotine or Flapless Method of Amputation. *Brit M J* 1916 II 481

Thomas suggests that instead of the circular amputations and the guillotine amputations some method be used which will minimize the pain of stump dressings and preclude the necessity of a reamputation. He is convinced that if proper treatment of the septic amputation were carried out the circular methods would cease to be practiced. He recommends the following method. Two lateral longitudinal incisions are made down to the bone on opposite sides of the point chosen for amputation and at the level of their distal ends a circular incision is made through the soft parts. The two flaps are then pulled up and the bone sawed through at a higher level. The flaps are then pulled down and the funnel shaped cavity is packed with gauze wrung out of either Wright's hypertonic salt solution or Dakin's solution, the ends being allowed to project out through the lateral incisions and the flaps pulled together with strips of adhesive. Vessels are tied with catgut instead of silk and no rubber is used for drainage. A small tube may be inserted for the introduction of Dakin's solution but the author prefers Gray's salt packs.

W. A. CLARK

Jennings, J. E.: Intrascapulothoracic Amputation of the Upper Extremity; Report of a New and Improved Method. *Bull. Dept. Public Health* 1916 1, 36

Jennings describes and recommends a new technique for the interscapulothoracic amputation of the upper extremity.

Incision is begun over the junction of the middle and outer third of the clavicle downward and outward at right angles to the fibers of the pectoralis major to the midaxillary line. The pectoralis major

is cut across the pectoralis minor cut close to the coracoid the subclavian vessels are isolated and tied the brachial plexus is injected with one per cent cocaine and cut. The incision is carried inward along the line of the clavicle and the flap is dissected back. The clavicle is cut at its middle third, and the incision is carried downward and backward around the shoulder to meet the anterior incision in the midaxillary line the trapezius is cut the rhomboid teres minor and latissimus dorsi are cut and the skin is closed with silkworm-gut sutures, and a rubber drain is placed through the stab wound in the lower angle. R G PACKARD

Tappeler F H von: *New Experiments on the Question of Homoplastic Transplantation On Capacity of Epiphyseal and Joint Cartilage (Neu Experiment zur Frage der homoplastischen Transplantationsfähigkeit des Epiphyseknorpels d des Gelenknorpels)* *Arch f kl Chir* 96 civil, 479.

Von Tappeler has already made a number of experimental transplants of the metatarsal bones in dogs and published his results. He now publishes the details of 26 experimental homoplastic transplantations of epiphyseal and joint cartilage of the radial head in rabbits.

These experiments showed that transplanted epiphyseal cartilage almost always perishes and that homoplastic transplantation of epiphyseal cartilage does not appear to be a clinical reality. In joint cartilage transplants the cells in the lower layers decayed, and were replaced from the remaining living joint-cartilage cells. Arthritic changes occurred only in a relatively small degree. The transplantable capacity of joint cartilage is therefore clinically considerably greater than with epiphyseal cartilage. Joint cartilage remains mostly alive and exercises its normal function.

Animal experiments controlled constantly by roentgen and microscopical findings confirm this observation. Von Tappeler found that in all transplants at least a few remnants of medullary tissue remained. From these and the medullary elements which with the connective tissues had entered from the mother soil in the transplant resulted the building up of large medullary islands and connecting layers, all of which had normal ingredients. The bone tissue always perishes, disappearing in from two to three months. The dead bone substance is absorbed and succeeded by osteoid tissues, from which bone tissue arises, which replaces the old bone. The periosteum always remains living and retains its bone-forming capacity. W A BRIDGMAN

ORTHOPEDICS IN GENERAL

Epstein, S I: *Treatment of Flat Foot in Old Patients.* *Med Rec* 96 xc, 790.

The author calls attention to the differences between youth and senility in regard to the joints.

In old age the cartilages begin to atrophy and there is less lubricant in the joints. Sprains and bruises, the effects of which in youth are scarcely noticed, cause much more trouble in senile conditions. Senile arthritis may affect any of the joints of the foot. In such cases pain is an early symptom and later there is bony thickening, creaking, limitation of motion, and tenderness. In such a condition it is useless to apply a rigid foot-plate without first preparing the foot by rest with or without a plaster cast, dietetic régime, and analgesic measures. Older people much prefer soft felt pads to hard plates. Exercise in a foot-circumduction machine for fifteen minute periods followed by massage is of much benefit. Bier's hyperemia and dry basking are useful in relieving pain. Metatarsalgia which is very common in old people is best relieved by a felt pad strapped properly under and behind the ball of the foot. Plates are not well tolerated for this condition. Spurs on the os calcis do not always warrant operative procedures. The author is inclined to believe that many of them can be helped by basking. The small exostoses will lose their senility eness after a number of years especially if the patient can avoid hard city pavements.

W A CLARK

Corbuser H D: *Observations and Experiments With Soldiers Feet.* *Jl Surg* 96 xcix, 58

A special study of the feet of the First Training Regiment was made both in camp and on the march, consisting in taking certain measurements and impressions, noting abnormalities of feet, legs, and posture. Many abnormalities and crippling conditions were discovered. The author advises that two or more months before going to camp a careful inspection of the feet should be made. If there are corns present, they call for a change in the shape of the shoe worn. Badly shaped toes, lapping over hammer toes or claw toes should be corrected, not by a chiropodist but by an orthopedic or general surgeon. The same is true of ingrowing nails and bunions and any tender or inflamed spots on the feet. If the arches are painful or obliterated on standing or if the foot assumes a valgus position during weight bearing treatment should be sought at once from one capable of dealing with these conditions. ROBERT B CORRIAN

Ashley D D: *The Postfebrile Treatment of Anterior Poliomyelitis.* *N Y M J* 96 d, 75

Three points are emphasized by the author as follows:

- 1 The folly of no treatment in the postfebrile stages while the patient still has pain in the nerve and the muscles are exquisitely tender
- 2 The importance of early treatment to combat deformity
- 3 The harmful effect of too much treatment in all stages.

Immediately following the subsidence of the fever Ashley recommends support of the affected parts i.e. to prevent stretching by weight of bed clothes that would produce toe-drop to prevent stretching of weak muscles and capsular ligaments and nerves by early sitting standing or assuming sprawling positions resulting in drop-shoulder and flail joint overextended knee or hand, flexed knee or thigh crooked spine, pendulous abdomen, etc.

This is the period of light diet good nursing warm dry packs, sheet baths, rest in bed, firm — not too hard and not sagging — support of paralyzed parts by non-constricting braces, plaster of Paris, sand bags etc. There must be no massage, no electricity no muscle-training no strychnine injections to irritate so long as there are pain and tenderness in the muscles.

In severe paralysis especially the patient should be maintained in the horizontal or inclined position for six weeks or longer by means of the Bradford or Whitman frame.

The author thinks that the disadvantages of recumbency have been exaggerated.

In the convalescent stage seldom beginning before four to six weeks and lasting for six months to two years he recommends proper braces, massage, heat and muscle-training. The brace should support without constricting. The patients must be frequently observed. Massage should be given twice daily by the parent. Each treatment should last about five minutes. Hot baths, hot dry packs woolen clothes two pairs of stockings, no restricting garters a flannel binder around the waist for pendulous abdomen are advisable. He recommends electrotherapy only as a placebo.

Muscle training in skilled hands is one of the best therapeutic agents known.

Not until after two years should any serious surgical operation be attempted such as tendon- or muscle transplantation, nerve grafting astragalec-tomy resection arthrodesis, etc. PHILIP LEWIS

Fenner E. D.: The Surgical Aspects of Infantile Paralysis. *N. Orl. M. & S. J.* 1916 lxi, 234.

In the stage of poliomyelitis which comes after the acute process the medical and surgical treatments overlap and it devolves upon the physician and the orthopedic surgeon to co-operate in the institution of treatment which will restore all possible power to the affected muscles and prevent deformities resulting from the loss in balance of muscular tone. Massage active and passive motion and muscle training are the most valuable of these measures. Hydrotherapy electricity and strychnine are of lesser if not doubtful, value. The deformities are the result of gravity the weight of the part itself as in foot-drop of adaptive shortening of muscle as a result of constant assumption of one position of stretching of the paralyzed muscles of retarded development of the bones from trophic disturbance. The ideal striven for in all treatment is a useful limb without brace support. The brace

cumbersome, unsightly expensive and always to be repaired is to be used only as a last resort. Operative interference in cases over eight years old as a rule is the method of choice. The results are always better in the adolescent than in the young child, but one should not be so bound to a rule as to refuse for instance, to do a tenotomy of the tendo achillis in cases of extreme contraction causing a bad equinus in even very young children. In some cases, stretching is sufficient in others tenotomy must be done. The more complicated operation of tendon lengthening serves only the same purpose as tenotomy. Fixation of paralyzed tendons into the bone so that they act as guy ropes to prevent deformities such as valgus, varus, and equinus, is a valuable procedure. Silk ligaments for the same purpose are not to be wholly relied upon. Arthrodesis is one of the most reliable operations for improving a flail ankle and excision of the astragalus serves admirably for correcting calcaneus deformities. Tendon transplantation although it has not fulfilled all the expectations of enthusiastic pioneers in the method is undoubtedly the operation of choice where a group of muscles on one side of a leg is paralyzed while those of the opposite side are active. W. A. CLARK.

Ducuing and Utenu: Shortening of the Healthy Femur in Certain Cases of Thigh Fractures with Extensive Shortening. (*Le raccourcissement du fémur sain dans certains cas de fractures de cuisse avec gros raccourcissement*) *Lyon ch.* 1916 xiii 814.

The authors point out that the various procedures in vogue in case of an excessively shortened limb after consolidation of a thigh fracture are unsatisfactory. They contend therefore, that in such cases where it is impossible to lengthen the injured limb that two limbs of equal length can be obtained by shortening the healthy limb.

At first sight there appear many objections risk of infection osteitis, pseudo-arthritis, and even death. The authors discuss these objections and show that operations on the healthy limb are not accompanied by more danger than the procedures for lengthening the affected limb. In fact that shortening the healthy limb is more regular easier, less dangerous and gives much more sure and rapid results than can be expected from the other method. A transtrochanterian osteotomy does not usually lengthen a limb more than 2 or 3 cm. In a shortening operation the bone removed may be of the exact length desired. It must be evident that manipulation of a limb which has already been modified by traumatism is more exposed to danger primary and secondary than is the case in healthy unaltered tissues. Similar reasons will apply to the facility for a new regular operation as compared with that on already altered muscles, etc.

The authors believe their method is indicated (1) in cases where there is great shortening by loss of osseous substances (2) where shortening has been

insufficiently emoliorated by a first operation (3) where there is great shortening by overriding of the osseous extremities (4) shortening of any kind when accompanied with great lesions of the soft parts.

The contra indications to the method are: (1) vicious attitude of the affected limb (rotation, etc.) (2) other lesions of the affected limb which render its use impossible (paralysis pseudo-arthritis) (3) lesions of the healthy limb (4) the condition of the patient.

The authors discuss their technique including the method of exact measurement of the shortening, the f clasons (transcraural anterior route) section of the healthy femur and subsequent treatment.

The authors state that the interventions which they have made in several cases with this procedure are excellent. They will later on publish these results. In the meantime they consider themselves justified in recommending it to surgeons.

W. A. BRECKMAN

SURGERY OF THE SPINAL COLUMN AND CORD

Peckham F. E. Scoliosis. Etiology and Treatment. *Am J Orth Surg* 9 6 31 75

The author states that in the formation of scoliosis there must of necessity be a softening of the vertebral bodies and also a corresponding laxness of the ligaments and soft structures. He offers as causes of this softening and relaxation of the various structures the following: hypothyroidism, rachitis, infectious diseases, including auto-intoxications, rapid progress of adolescence.

He recommends thorough careful treatment of the underlying cause plus brace and mechanical treatment. He strongly advises putting the patient face down on a curved frame with traction applied to head and feet. He claims putting the patient face down separates the vertebral bodies more than when the back is down. He thinks in an early case treatment of the etiologic cause is of more importance than the mechanical treatment. Early treatment is strongly recommended and this can be instituted only when the public and profession are educated to an early recognition of the condition and cause.

PHILIP LEWIS.

Cotton, F. J. Fractures of the Transverse Processes of the Vertebrae. *Intern. M J* 9 16 2211, 38

The author reports cases selected from the roentgen ray files presumably of some hospital. In 6 of these there was history of trauma, but some of the fractures as shown in the plates appeared to be old ones. In the other 6 in which no history of trauma was obtained, the various plates showed old lesions, separation of transverse processes, smooth rounded-off false joints and lumbar ribs. The suggestion is made that some of these appearances may be the result of incomplete ossification. The conclusion is drawn that anomalies in this region are frequent and that roentgen plate findings of these conditions may be improperly interpreted as fractures. Real fractures may unite by fibrous union without persistent symptoms and be found in routine examination. One case is mentioned in which the patient collected some thousands of dollars damages for fractured transverse processes the importance of which was overvalued.

W. A. CLARK.

Gullband G. Extraction of a Shrapnel Bullet Encrusted in the Antero-Internal Face of the Third Lumbar Vertebra (Extraction sous cran d'une balle de shrapnell encrûstée à la face antéro-intérieure de la III^e vertèbre lombaire). *Rev. gén. de Chir. Orthop.* 9 6 22 534.

In the case reported by the author radiography indicated the presence of a shrapnel bullet between the third and fourth lumbar vertebrae.

An incision was made parallel to the median line and under the guidance of the radioscopic screen extraction was attempted. Some bone fragments were found coming from the fourth transverse lumbar apophysis. A curette was delicately pushed until contact with the bullet was reached which was found lodged in the antero-external part of the body of the third lumbar vertebra and the bullet was extracted without difficulty.

W. A. BRECKMAN

Hosmer A. J. Postural Prophylaxis in Relation to Deformity. *Colo Med* 9 6 211 335

Many cases of paralysis, pronounced hopeless because the varieties of paralyses are not distinguished, do present possibilities of cure. There are three classes of paralyses: permanent paralysis from complete degeneration of nerve-center; temporary paralysis from transitory disease of nerve-center; and temporary paralysis from non-use or overstretching of muscles involved. It is important to make this differential diagnosis. A muscle stretched long enough will cease to act although there may be no permanent organic change in the governing spinal cells. This muscle relieved, will regain its power. Likewise if the lesion in the nerve is transitory and the muscle has been relaxed or overstretched by gravity or habitual posture or opposing muscles, the muscle on account of its mechanical disadvantage will not perform its function of contracting until that mechanical disadvantage is removed. Such is true in many cases of drop-wrist where on account of the initial paralysis and shortening of the flexors, the extensors are placed at a mechanical disadvantage and become impotent from non-use. Here the treatment is to begin by lengthening the flexors and shortening the extensors by correcting the position of the hand.

In poliomyelitis the early treatment is rest — keeping the head and spinal column at rest, relaxing the paralyzed muscles by keeping the foot at a right angle if the extensors are paralyzed, the knee extended if the quadriceps is affected, the hand dorsiflexed to prevent wrist-drop and the foot everted when the peronei are paralyzed. Operative procedure may be necessary in early cases to effect the posture for relaxation, as tenotomies or division of bands of fascia. Splints or appliances should be adjusted so that in walking the body weight is properly distributed.

In cases of permanent paralysis, Hosmer advises either tendon fixation as for instance, in paralysis of the peronei, where a peroneus tendon is drawn taut and buried in the fibula, or arthrodesis in cases of flail joints.

The author reports two cases, one a wrist-drop that was rendered nearly as good as the other after disuse for twenty two years. The second case was a paralytic equinus, in which a wedge of bone was removed from the dorsum to permit relaxation of the peronei. A good result followed.

ROBERT G. PACKARD

Dupré, H. Anatomoclinical Notes on Thirty Spinal Cord Injuries (Notes anatomo-cliniques sur 30 blessés de la moelle) *Presse méd* 1916 p. 491

Thirty spinal cord injuries have been observed in the author's ambulance service from September, 1914 to January 1916 being about 5 per cent of all injuries. The global mortality in these cases was 79 per cent. The prognosis therefore, is very grave, and it is extremely grave in injuries in the dorsolumbar and dorsosuperior zones on account of the polyvisceral concomitant injuries. The prognosis is somewhat better in the cervical zone. Death usually ensues within a week of the injury caused by infection arising in the projectile tract meningomyelitis, ascending urinary infections, etc.

The frequency and gravity of primary infective complications appear to authorize early surgical intervention. In any case in which a radiograph shows a possible compression by a projectile or by an osseous vertebral fragment, when the projectile tract can be opened and cleared it will tend to prevent infections and to diminish sphincteral and trophic disturbances.

W. A. BRENNAN

SURGERY OF THE NERVOUS SYSTEM

Pitres, A.: Waller's Law and the Theory of the Trophism of Nerves (La loi de Waller et la théorie du trophisme des nerfs) *J de méd de Bordeaux* 1916 lxxvii 251

Although it was previously known that when a nerve was sectioned its peripheral end became inextensible it was Waller who after five years of laborious experimentations and observations first formulated the law which bears his name and which is expressed in these terms. When the continuity of a nerve is interrupted in such a manner as to prevent its regeneration, the peripheral end, separated from its trophic center degenerates, while its central end, still in touch with this center remains normal. This law was based on four facts established experimentally by Waller.

1. After the section of a peripheral nerve sensory or motor all the nerve-fibers of the peripheral segment suffered total degeneration, the central end remaining unaltered.

2. When an anterior rachidian root was sectioned the peripheral segment of this root and the fibers of the corresponding peripheral nerves degenerated, the central end remaining intact.

3. When a posterior root was sectioned the central segment of the sectioned root degenerated the peripheral segment was unaltered.

4. After undergoing degeneration fibers of sectioned nerves are susceptible of regeneration only from the intact central end.

The Wallerian theory of trophism of nerves is based on the conception that the trophicity of nerves is governed by the cells in which they take

their origin. Motor nerves arise from the anterior cornu of the medulla. The sensory nerves have their trophic center in the rachidian ganglionic cells.

Waller's law has been accepted as rigorously exact for more than half a century, nevertheless it cannot be considered infallible and several objections have been set up. (1) It has been suggested that the peripheral end of a sectioned nerve does not necessarily degenerate, (2) that after section intact fibers will be found in the peripheral end and degenerate fibers in the central end (3) after the amputation of a limb the part of a nerve remaining in connection with the medulla undergoes an ascending atrophy (4) there are objections to the Wallerian idea that regeneration may be effected only from the central end.

1. Regarding the first objection, Pitres says that in the very great number of nerve-sutures made during the present war there has not been cited a single example of rapid functional restoration susceptible of casting doubt on the generality of Waller's law in so far as the degeneration of the peripheral end is concerned.

2. The second objection, far from weakening Waller's law shows it to be well founded since it proves that in a sectional nerve all the fibers separated from their trophic center degenerate and that only those fibers escape degeneration which for some reason remain in direct continuity with their mother cells.

3. Regarding the third, Pitres thinks that ascending atrophy has nothing in common with

Wallerian degeneracy and that it is a biologic phenomenon due to loss of function.

4. As to the fourth the part of Waller's law affirming that the fibers of the central end remain normal does not correspond strictly to reality. They do not habitually degenerate like those of the peripheral end but they do not remain normal. There is usually an abnormally intense cellular chromatolysis. In some cases cells die and the fibers referred to them degenerate.

In the second part of his article Litres considers the extension of the doctrine of Wallerian trophism to the study of the pathology of the nerves, the muscles, and the nerve-centers. The general conclusions, which are of clinical value drawn from his study may be summarized.

1. When any prolongation of a neurone is separated from its mother cell its distal segment with reference to the cell degenerates. The proximal segment preserves its vitality.

2. This rule implies that the fibers of a nerve which is sectioned or is interrupted in continuity by destructive lesion necessarily degenerate distally and remains intact proximally.

3. When a motor nerve degenerates the muscles with which it is in agreement degenerate also by loss of function with reaction of degeneration.

4. Regeneration of the peripheral segment of an interrupted nerve results from neurofibrillar originating in the distal extremity of the central stump of the nerve. In the case of a motor nerve this may be accompanied by muscle regeneration.

5. The nerve fibers of the root region like the peripheral nerve fibers degenerate when separated from their mother cells, and are not susceptible of regeneration.

6. Quite apart from Wallerian degeneracy is the biologic degeneration due to cessation of function and nutrition and which is expressible in the axiom the function governs the organ. W. A. DEAN, M.D.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

Stone, W. S. A Review of the History of Chemical Therapy in Cancer. *Med. Rev.* 36: 18.

Since the beginning of the nineteenth century chemical caustics were an increasingly valuable resource of all the noted surgeons in cancer surgery until during the sixth and seventh decades they became a fair rival of the knife. In spite, however, of the success which had attended their use they became less frequently applied by the skillful surgeons during the last quarter of the century. During the early years of the twentieth century their position in cancer therapy has become not unlike that described by Young over one hundred years ago. Caustic applications were ushered under the equivocal sanction of a nostrum they were pursued as a nostrum and then they were turned out as a nostrum. In answer to the question if they have a field for use at the present time the author reverts to the estimate of their value when previously used and to the reason for their abandonment. Their value, he says, as compared with the operation by the knife was not satisfactorily defined. No statistical data of either method were available.

After the use of the chemical caustics there is the evidence of competent observers that the interval before recurrences appeared was often long and there is much reason to believe that cures were more frequent than after operations with the knife. The danger from poisoning was made a negligible factor by the substitution of zinc chlorid for arsenic. The author does not find that their value in the hands of competent surgeon was discredited but the reason for their abandonment appeared to be in

the new conception of the possibilities which scientific medicine furnished to the practical surgeon during the closing years of the century. Pathological anatomy was making an early and exact diagnosis more a habit the results of bacteriology research promised to make primary mortality a negligible factor and primary healing of the wound a definite certainty thus encouraging the surgeon to believe that ultimately the development of his technique would preclude the necessity of using chemical methods which were less attractive and extremely difficult to apply. The result is that the surgical age, as expressed by Clark in regard to uterine cancer is greater but owing to our failure to decrease appreciably the number of patients applying for treatment in the earliest stages of the disease the primary mortality has markedly increased. Operative sequelae are frequent and recurrences are still discouragingly large. The availability of surgical skill sufficient to effect a reasonable salvage is extremely limited.

The author concludes that the evidence of the value of chemical caustics is sufficiently strong to justify a new study of their technical application and a discussion of the kind of cases in which they may be most efficiently applied. In so doing they may afford a valuable adjunct to the use of the knife and become applicable to a number of well developed growths the extirpation of which results in a high primary mortality and few favorable cures.

Regarding the editorial propaganda of cancer, it seems to the author that the application of all reasonable methods of treating cancer will encourage the public to seek early relief from competent physicians. The fear of an operation still remains an important reason for the frequent delays in asking for advice.

Grubbe, E. H. : One Hundred and Thirty nine Cases of Skin Cancer Cured by X Rays. *Interst M J* 1916 xxvii, 149.

Of 139 cases of skin cancer cured by X rays 2 have remained free from recurrence 14 years 2 for 15 years, 3 for 12 years 2 for 11 years 3 for 10 years, 4 for 9 years 3 for 8 years 6 for 7 years, 8 for 6 years 14 for 5 years, 20 for 4 years 20 for 3 years 25 for 2 years, 27 for 1 year. Sixteen cases were lost from observation some having died from intercurrent disease. Although 500 cases have come under observation the author has confined this list to 155 where the roentgen rays were exclusively used. In regard to the selection of cases for treatment he believes that when only those suitable for treatment are taken the results will be uniformly good. Attention is called to the fact that the roentgen rays possess a dual action and that it is possible to stimulate a growth, by not giving a sufficient dosage and that in some instances failure results from the lack of vigorous treatment although he has not found massive doses of high penetrating rays always necessary in fact many of these superficial conditions can be healed by low radiation. In these cases, the area treated should extend well beyond the margin of the disease and the exposure should be sufficient to produce a mild irritation, or even considerable soreness when the reaction is pushed to this stage recurrence is not so likely to follow. The method being painless non-confining and non-disfiguring makes it a safe method for the treatment of uncomplicated skin cancer.

W. S. NEWCOMB

Berkowitz, S. : Carcinomatous Degeneration of Sebaceous Cysts. *Surg Gynec & Obst* 1916 xxvii, 469.

Although several authors claim that sebaceous cysts rarely undergo carcinomatous degeneration Seff and Berkowitz observed three such cases within twelve months. They summarize their report as follows:

- 1 The origin of malignant changes in simple sebaceous cysts can readily be traced by a study of the embryology of the sebaceous glands.
- 2 Malignant degeneration of sebaceous cysts may occur at any period of life.
- 3 Local irritation is an important exciting factor in the malignant degeneration of a simple sebaceous cyst.
- 4 Removal of all sebaceous cysts and more especially of those which are exposed to local irritation as on the scalp is strongly advised.
- 5 Removal becomes urgent in all sebaceous cysts which are rapidly increasing in size even if the local glands are not enlarged.
- 6 All excised sebaceous cysts should be examined microscopically.
- 7 Early and wide excision of the skin and subcutaneous tissue beyond the infiltrated or ulcerated edges of a sebaceous cyst which has undergone malignant degeneration affords a complete cure.

BLOOD

Williamson, C. S. : Influence of Age and Sex on Hemoglobin. *Arch Int Med* 1916 xviii, 505.

The author discusses the various methods for the determination of hemoglobin and presents a spectrophotometric analysis of 919 cases. He draws the following summary from his study and observations:

The amount of hemoglobin in the blood of normal persons varies greatly at different ages and follows a well-defined curve. These age variations are so great that in determining whether a given blood contains more or less hemoglobin than normal it is imperative to consider the age. These variations are greatest from birth to the sixteenth year. Between the ages of 16 and 60 there is a marked difference between the two sexes, this difference growing less after the sixtieth year.

In view of these facts it is evident that hemoglobinometers should be standardized in absolute terms, most conveniently in grams of hemoglobin per 100 ccm of blood. (Because of the superior accuracy attained it is highly desirable that the standardization of hemoglobinometers should be spectrophotometrically controlled.)

Whether or not a given blood contains a greater or less amount of hemoglobin than the normal can be determined only by a comparison of the absolute value obtained by a hemoglobinometer thus standardized with the normal value for that age and sex.

GROVER E. BRILLEY

Rowe, A. H. : The Albumin and Globulin Content of Human Blood Serum in Health Syphilis, Pneumonia and Certain Other Infections, with the Bearing of Globulin on the Wassermann Reaction. *Arch Int Med* 1916 xviii, 455.

In spite of numerous results found in the literature the albumin and globulin content of serum in health and disease has been reinvestigated by the use of Robertson's method because of the simplicity and freedom from possible error of the new technique as compared with that of former methods. The small amount of serum used is another advantage and has made possible the use of two controls on each serum examined by the author. The results which can be obtained are uniform especially if the author's suggestions about the technique which he states will soon be published are followed and his automatic pipette is used to assure accuracy of measurements.

During the last seven months a number of normal serums have been examined. The average results differ slightly from those obtained by Robertson's method previously reported. The total protein is lower than in the previous series due to the fact that serums were taken, except in a few cases from patients who were confined to bed as a result of a fracture or uncomplicated hemiotomy or from those who had been lying down for twenty five or more minutes. The non proteins are slightly higher.

while the percentage of globulin in the total protein is moderately increased. The last four sera were taken from the same person at different times throughout a period of six months. The values are quite uniform.

A series of normal cases shows that serum albumin varies between 4.6 and 6.7 per cent that globulin varies between 1.2 and 2.3 per cent that total proteins vary between 6.5 and 8.3 per cent that non-proteins vary between 1.1 and 1.3 per cent while the percentage of globulin in the total protein varies from 16 to 32 per cent. The average value for albumin was found to be 5.6 per cent for globulin 1.9 per cent for total protein 7.5 per cent for non-protein 1.24 per cent and for globulin 5.5 per cent.

The normal values for total protein, albumin and globulin from the literature are given while the literature on these proteins in health and disease as well as on methods of their estimation is summarized.

The former use of the refractometer in medical research is discussed while the error in Reiss method for the determination of total proteins is pointed out. It is shown that Robertson's micro-refractometric method for the determination of total protein is free from evident error and for the estimation of albumin and globulin is the most satisfactory method yet proposed.

In syphilis the globulin is definitely increased while the total protein remains about normal.

In pneumonia the globulin is increased more in relation to the total protein than in syphilis, while the total protein is reduced due probably in large measure to a dilution of blood serum by water retention which occurs in fever.

In many chronic septic conditions in mild infections and typhoid the total protein is not decreased as it is in pneumonia. Globulin seems definitely increased in all infections except in acute tonsillitis, typhoid and in certain mild infections, such as chronic bronchitis. The marked dilution of serum which occurs with anasarca is shown in two cases of acute infection associated with acute nephritis, which were investigated.

The evidence presented shows that the Wassermann reaction is not due to a quantitative increase in the serum globulins. GEORGE L. BAILEY

Moots, C. W.: Value of Blood Pressure Observations Made During Surgical Procedures. *Transactions M. J.* 9 6 xliii, 837

The ratio may be normal between the limits of 40 and 60 per cent. If the case has vascular contraction and rigidity as shown by a high diastolic pressure but has a compensating heart that is pushing the blood to the periphery as shown by a corresponding rise in the systolic so that the pulse-pressure remains near the 50 per cent ratio to the diastolic, there need be no hesitancy in proceeding with a needed surgical operation. If however the pressure-ratio is low say 20 per cent and taking

into consideration the probable presence of acidosis or other toxemia, it is wise to offer a grave prognosis. On the other hand if the pressure ratio is greater than 80 per cent the prognosis is at least equally grave as one may look for little cardiac reserve force because of overwork already done so that slight shock becomes very grave.

The following conclusions are given

1 The systolic pressure alone is of very slight, if any, value

2 The diastolic pressure alone is of much more value than the systolic alone

3 The pressure ratio is the essential factor and offers the earliest danger signal

4 There are certain elements in technique which have a marked and constant effect upon the pressures. These are as follows

(a) The physical or emotional state of the patient.

(b) The position of the patient upon the table, the extreme Trendelenburg being the worst

(c) Overdoing by the anesthetist

(d) The amount of traumatism inflicted by the actual operation, such as cutting and tearing the tissues with scissors, the hands, and other dull instruments; the packing of large gauze packs instead of rubber tissue into the abdominal cavity

(e) The preservation of the fluids of the body up to the hour of operation, this being necessary to maintain the usual pressures. EDWARD L. CORWELL

Minnot, G. R., and Lee, R. I.: The Blood Platelets in Hemophilia. *Arch. Int. Med.* 9 5, xlvii, 474

The blood platelets from two typical cases of hemophilia were studied, because in the course of some work on coagulation the authors were greatly impressed by the importance of the blood-platelets. Previous work showed that in typical hemophilia the formed elements were in essentially normal numbers. The calcium and fibrinogen content of the blood and thrombin in the serum was within normal limits. The antithrombin was normal or often slightly increased. The activity of the tissue juice was probably normal. The prothrombin time was markedly delayed. These results agreed with the findings in the authors' cases.

The hemophilic blood platelets were obtained directly from the blood and from various types of salted plasmas. When normal blood-platelets in about normal amounts were added to hemophilic plasma they caused it to coagulate in normal or nearly normal time. When hemophilic blood-platelets were added even in approximately seventy-five times as great a concentration as in normal blood though they definitely shortened the coagulation time they never brought that time to anything approaching normal limits.

By using the method of formation of thrombin described by Bordet and Delange the blood platelets required more time to form thrombin when derived from hemophilic than from normal blood. This is consistent with the reclothing phenomenon observed in hemophilic bloods.

Microscopically under favorable conditions of thrombin etc. hæmophilic platelets undergo the usual transformation in apparently normal time. Under the most favorable conditions hæmophilic platelets act nearly normally. On the other hand in the case of oxalated plasma recalcified by an amount of calcium that is not the optimum amount, wide discrepancies are seen in the clotting times when normal and hæmophilic platelets are added.

This evidence suggests, as does the fact that partial solution of the hæmophilic platelets in water was usually more efficient than hæmophilic platelets in suspension, that the delay in coagulation in hæmophilia occurs in the initial step in coagulation, which seems to be a rendering of the platelets available by some process like solution.

The authors are inclined to present the theory that the active coagulating principle of the tissue juice is derived in part, if not wholly from the blood platelets. As evidence on this point they present the fact that in hæmophilia with a normal number of abnormally resistant platelets they had a very abnormal coagulation time, but a normal bleeding time. In purpura hæmorrhagica these conditions were just the opposite. The normal number of platelets, though few in number were sufficient to form a little thrombin and clot fibrinogen in essentially normal time. The value of an excess of platelets seems to be to furnish the active coagulating principle of the tissue juice.

On one of the hæmophilic patients transfusion was performed with 600 ccm of normal blood. The coagulation time before transfusion was from 60 to 120 minutes. After transfusion it was seven minutes. A gradual lengthening of the coagulation time occurred for three days when it was again 60 minutes. Since about three days is generally assumed to be the length of life of the blood platelet, the authors' actual clinical findings seem to corroborate the findings *in vitro*.

They conclude with the statement that in hæmophilia they have a hereditary defect in the blood platelets. This defect consists they believe, of the slow availability of the platelets for the purposes of coagulation.

GEORGE E. BRILEY

POISONS

Colston, J. A. C.: Tetanus Following Gunshot Wounds *Bull Johns Hopkins Hosp* 1916 *xxvi*, 294.

The author comments upon the prevalence of tetanus in gunshot wounds in the European War, and he reports six cases in which the method of Meltzer and Auer was used.

The series of cases is, the author states, of course too small to demonstrate the value of any method of treatment. The most striking result was obtained in Case 2 with the intraspinal administration of magnesium sulphate. This method was first introduced after the experimental studies of Meltzer and Auer. Blake reported two cases in

which the procedure was used successfully. Miller reported another successful case and added a review of all cases treated by the method up to 1908. Falk reported favorable results in cases occurring during the Balkan War, but prefers the subcutaneous method of administration. Kocher emphasizes its value in severe cases the treatment serving to control the tonic spasms until enough antibodies were produced to successfully combat the toxins.

From the reports of those who have used the intraspinal administration of magnesium sulphate it would seem that this treatment is of great value in cases in which a fatal outcome is to be feared from spasm of the glottis or from exhaustion and it is with the hope that this method will be more generally used in properly selected cases of the disease that the author has reported these cases.

GEORGE E. BRILEY

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Loeffler, F.: The Favorable Action of Cholinchloride in Scar Injuries and Scar Contractions (*Die Günstige Wirkung des Cholinchlorids bei Narbenschädigungen*) *Zentralbl. f. Chir* 1916 No 43 841

The author tried out the action of cholinchloride suggested by Fraenkel in the treatment of scar contraction or scar injuries. It is especially adapted to cases where the skin lies directly upon the bone, as over the tibia, olecranon, and condyles, where it is subject to traumas and where healing is so slow. It is also adapted to cases of scar contracture in the axilla, popliteal space, and in the elbow. If a scar over an exposed area is slightly traumatized an ulcer will frequently develop and healing may last two to three months and after a short period the same procedure may be repeated.

The author employs the substance in a 5 per cent solution and injects 10 ccm. at a time. But it is not sufficient to inject the substance. It is just as important to employ other agents as Fraenkel has emphasized. Immediately after the injection the author applies heat over the site of the injection. One hour afterward the patient is given a hot air bath lasting one half hour. This is followed by energetic massage of the scar and active and passive motion. This treatment is given three times daily. Meanwhile a thermophore or an application of a thick layer of cotton keeps the scar warm. After five to six days the injection is repeated and the same procedure followed as before.

The following classes of cases were treated with this method:

1. Scar contraction of skin adherent to muscles and tendons interfering with motility of the part.
2. Scars in the axilla, elbow and popliteal space causing interference with flexion and extension.
3. Scar adhesions to bony prominences, in the middle of which ulcers had formed.

Especially in the latter class of cases are the in

jections of cholinechloride indicated as these cases are not benefited much by any other form of treatment
L. A. JUNKE

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Berti, A.: Experimental Cholemia; Action of the Bile on the Heart (Colemia sperimentale azione della bile sul cuore). *Gazz. degli osp. d. la Milano* 9 6 xxxi 30

Berti gives a résumé of previous experimental research work on the effects of the injection of bile in the circulation. He has made a number of experiments on dogs.

As regards the heart Berti found that when the amount of bile injected in the blood circulation was relatively small the diastolic pressure as well as the arterial pressure quickly fell to a minimum gradually rising and returning to normal in from one half to three-fourths of an hour but if the injections are large, or quickly repeated then the cardiostasis and arterial pressure do not return to the normal until two or three hours.

According to Berti bile has a specially hypertensive action on the heart. Many other authors have reported an opposite finding. In recent experiments of Roccavilla injections of strong solutions of bile augmented the arterial tone and vitality.

The results obtained generally by Roccavilla, Braun and Mager are in accordance with the findings of Berti that while small doses of bile may be hypotonic for the myocardium and depress the contractile energy concentrated solutions of bile are hypertonic for the heart muscle.

W. A. BEE

Baer, C. and Helmholz, H. F.: The Bacteriology of the Urin in Healthy Children and Those Suffering from Extra urinary Infection. *Am. J. Dis. Child.* 9 9 xx 145

The problem of pyelocystitis in infancy and childhood has become more and more important as knowledge has increased as to the frequency of the infection and the possible serious consequences that it may entail. A few facts regarding pyelocystitis have been pretty well established namely, that the infection is very much more common in girls than in boys, that the infecting organism is more frequently the bacillus coli and that the symptomatology of the condition is so indefinite as to make a diagnosis practically entirely dependent on the examination of the urine.

Regarding the mode of infection there seems to be considerable difference of opinion. In practically all articles on the subject three possible modes of infection are given: (1) ascending infection in the lumen of the urethra; (2) infection by way of the anastomosing lymphatics of the large intestines and urinary tract; (3) infection by way of the blood stream.

In 118 specimens of carefully catheterized urine

from 61 different girls, 61 were sterile and 57 contained bacteria. Of those from normal infants, 13 were sterile and 1 contained bacteria. Of those from extra-urinary infections in patients under two years of age none were sterile and 24 contained organisms. In those from girls over two years 38 were sterile and 21 contained bacteria. The number of bacteria found in Series 1 was considerably larger than in Series 2. This may be explained the author states, by the fact that in the older children one can cleanse the urethral orifice much easier than in the infant and introduce the catheter directly into the urethra. The bacterial flora was practically the same in both series, gram positive cocci and diphtheroid organism predominating the former being present in practically every case in which any organisms were found. In no instance were gram negative bacilli found in such numbers in both specimens that it seemed probable that it was more than an accidental contamination from the urethra.

The author concludes from his study that organisms of the colon bacillus group are not normal inhabitants of the female urethra in extra-urinary infections occurring in the first two years of life. The coli group of bacilli are frequently found in the urethra (one third of the cases) and in girls over two years of age the urine is almost free from bacilli and in the author's series entirely free from bacilli of the coli group (8 normal 2 other infections).

GROVER L. BRIDG

Aschner, B.: Diabetes Insipidus and Cerebral Metabolic Centers. *Berl. kl. Wochenschr.* 9 6 V 3

From his study and consideration of recent researches the relation of diabetes insipidus to alterations in the hypophysis Aschner draws these conclusions:

1. It has not yet been demonstrated with certainty that the hypertensive action of pituitrin can be ascribed to the intermediate parts and not to the nervous part.

2. The same remark applies to diuretic action.

3. It is certain that the pars intermedia has in substance nothing to do with adipose or albuminous changes, with arrest of growth, or with genital disturbance such effects occur exclusively in the domain of action of the anterior lobe of the hypophysis.

4. The diuretic action of pituitrin, demonstrated unquestionably by experiments, is in opposition to the observations according to which polyuria is not favored but inhibited in diabetes insipidus.

5. It is therefore logical to think of the participation of a new factor and this would be the vegetative center of the middle brain as admitted by various authors.

6. For such a vegetative center in the middle brain there apply first a series of facts already noted such as the thermal center in the striated bodies, and Eckardt's center for the regulation of water in the mammary bodies. Second the

hypothalamic glycosuric puncture described by Aschner and the phenomena observed following the mechanical or electrical excitation of the tuber cinereum violent manifestations of pains rarefaction of the pulse even to arrest of the heart increased blood-pressure contraction of the gravid uterus, of the bladder intestine etc. Third the sympathetic center in the tuber cinereum found by Aschner by Karpus and by Kreidl which can be demonstrated by mydriasis and sudorific secretion in the cat.

7 To the participation of this center of the intermediate brain in development in metabolism in regulation of temperature and genital development it is permissible to include not only diabetes insipidus but all the vegetative disturbances and perhaps even psychic conditions consequent to affection of the cerebellum, of the hypophysis, and of the pineal gland.

W. A. BREXMAN

Renton J M: An Experimental Study of Extirpation and Transplantation of the Thymus *Glasgow M J.*, 1916 lxxvi 14.

The author notes that extirpation with or without subsequent transplantation has been widely used as a means of studying the ductless glands and, in some of them these methods have yielded valuable results but so far they have failed to give any very definite information as regards the function of the thymus.

Removal of the thymus alone has been extensively carried out but the results have been somewhat conflicting and have varied in different hands, and according to the animal used. In some instances its removal has not produced any effect at all and in others where definite symptoms have been described, it has not appeared absolutely certain that these were really due to the loss of the thymus.

In considering this subject it is necessary to remember that one is dealing with an organ whose function tends to diminish after birth and is, consequently especially liable to undergo degeneration. Henderson has shown that castration causes a persistence of the thymus, and consequently it was decided to do the transplantation in the first instance in castrated animals.

In guinea pigs the thymus lies high up in the neck, and its complete removal is easy so that from an operative point of view they are very suitable.

In the first three experiments the testes were removed the thymus completely taken out, and a piece of one lobe transplanted into the tunica vaginalis. On examination from twenty to thirty days later no trace of the thymus was found.

Two transplantations into the abdomen were next tried but in one there was complete degeneration a week later and in the other twenty-one days later there was only a minute rim of thymic tissue left.

The rectal sheath was next tried and here successful transplantations were obtained. The sheath was opened and a space for the gland formed below the muscle in the subperitoneal tissue. The

gland was placed in this and the muscle united over it. Great care is necessary so as not to open the peritoneum which is very fine. It was found that if the peritoneum was opened the transplant tended to absorb. On the other hand if it was not placed below the muscle in the subperitoneal tissue, it did not grow so well.

From his study and experiments the author concludes as follows:

1 In guinea pigs the thymus can be readily transplanted into the animal from which it was removed.

2 In transplantations from one guinea pig to another healthy thymus tissue has been found up to fifty three days after transplantation.

3 The thymus is rapidly absorbed when transplanted to the peritoneum (abdomen and tunica vaginalis) or under the skin, but grows in the subperitoneal tissue.

4 No symptoms are caused by transplantation of the thymus.

5 It has not been possible to determine whether the thymus transplant functionated even when it grew well.

6 Total removal of the thymus does not cause any apparent symptoms in young guinea pigs and rabbits.

GEORGE E. BRILL

Graham, A. A Study of the Physiological Activity of Adenomata of the Thyroid Gland, in Relation to Their Iodine Content as Evidenced by Feeding Experiments on Tadpoles *J Exp Med* 96 iv 345

This study was undertaken to supplement that already done by Lenhart who carried out experiments along the same line as regards the thyroid but who used desiccated human canine sheep and ox thyroids with iodine determinations on each specimen. Since therefore it has been established that the action of non tumorous thyroid on tadpoles is dependent upon the iodine content, Graham undertook this study to determine whether or not the so-called tumors (adenomata) of the thyroid including carcinoma had the same action as non tumorous thyroid and whether this action corresponds to the iodine content of the tumors. Human thyroids were used in the experiments. Twenty-one specimens of desiccated thyroid were prepared from eighteen glands removed in Crile's Clinic at the Lakeside Hospital.

From a review of these experiments it seems evident that the so-called tumors (adenomata) of the thyroid possess the property of taking up iodine and metabolizing it into the active combination in the same way that the non tumorous thyroid tissue does, although not so readily nor to the same degree and the action on tadpoles of feeding desiccated tumorous thyroid tissue does not differ qualitatively from feeding desiccated non tumorous thyroid tissue. The action in either case depends the author states upon the iodine (active iodine) content, and in the case of the adenomata bears no

constant relation to the state of their growth or differentiation.

The author's conclusions as to the effect of feeding desiccated thyroid to tadpoles agree in general with those of Lenhart. The action of the thyroid depends not upon a specific stimulus to differentiation but upon a stimulation of metabolism in general in proportion to the active iodine and the quantity consumed. High iodine contents produce rapid emaciation at the same time resulting in differentiation even in tadpoles dying in eight to twelve days. Low iodine contents result in differentiation at an earlier period than the controls. Tadpoles fed on thyroid with practically no iodine grow better than the controls in this instance the thyroid act as simply as a food.

Finally the author points out the interest that the results of these experiments may have in connection with the question of function of the thyroid. To those who hold that tumor lack the capacity for physiological function the adenomata of the thyroid could not be consistently regarded as tumors. To those who hold physiological function as a possible property of tumor tissue the adenomata might be regarded as tumors. Future studies, the author states, might warrant a recognition of different grades or degrees of tumor. On this basis the foetal adenoma (very little differentiation) might represent a higher degree of tumor than the diffuse colloid or simple adenomatous thyroid in which the adenomatous nodules represent to a great extent throughout the whole gland and are well differentiated. The author believes it is certain that there are all grades and degrees of growth and differentiation in the life history of foetal adenomata of the thyroid, from the pure foetal undifferentiated adenoma with little or no iodine to the simple or colloid adenoma well differentiated and with varying amounts of iodine approaching that of normal thyroid.

GEORGE E. BAKER

Rogoff J M and Marine, D. Effect on Tadpoles of Feeding Thyroid Products Obtained by Alkaline Hydrolysis. *J Pharmacol. & Exp. Therap.* 9 6 ix, 57

In this report the authors have recorded the results of the effects of the products of alkaline hydrolysis of the thyroid on tadpoles (larvae of *Rana pipiens*). The products were prepared from normal ox, normal sheep and markedly hyperplastic lamb thyroids after the very simple method introduced by Kendall. He has designated the products as follows: (1) product A, (2) product B, (3) residue, and has described the pharmacological action of these products in man, dogs, and goats. Product A has the typical action of desiccated thyroid of markedly accelerating metabolism. Product B he found to have a specific action on the skin, changing a dry scaly skin to a moist, normal condition, and also relieving certain subjective symptoms of myxedema, as soreness of bones and joints and heat flashes. Basinger reported the

absence of any effect on the growth curve of thyroidectomized (cretin) rabbits, from the use of product B while product A had the characteristic accelerating action on metabolism noted by Kendall.

Hydrolysis of whole thyroid after the method of Kendall concentrates the substance producing the hyperthyroid metabolic effect of thyroid. Kendall designates this substance product A. The iodine content of the products the authors obtained were about six to seven times as high as those of the whole gland and the pharmacological activity approximately twelve times as great. The activity of product A is proportional to the iodine content. Product A does not produce symptoms of poisoning in guinea pigs when introduced intraperitoneally.

It has long been known that the activity of whole thyroid is in general proportional to its iodine content and also that iodine free thyroid is inactive and that the authors have shown that an iodine free product A is also inactive. Attempts to activate it by artificial iodination were negative. Product B and the residue, although they contain iodine are apparently inactive. The slight loss of weight of the tadpoles noted in most of the experiments might be due, the authors think, to incomplete hydrolysis or to incomplete separation of product A inasmuch as the method is a crude one. This method of hydrolysis has afforded an additional means of establishing the fact that the thyroid normally contains both active and inactive iodine in varying amounts. The authors' experiments confirm the statements of Morse and of Lenhart that iodolysin has a thyroid like action on tadpoles, but this action takes place more slowly.

GEORGE E. BAKER

Marine D., and Rogoff J M. How Rapidly Does the Intact Thyroid Gland Elaborate Its Specific Iodine Containing Hormone? *J Pharmacol. & Exp. Therap.* 9 0

The authors' purpose in this paper was to record the results obtained from the feeding of a series of thyroids and their controls to tadpoles. The thyroid material was obtained from dogs, and the results were as follows:

Following the injection of 50 mg of iodine into the circulation definite histological changes (always involutionary) can be detected within twenty hours in favorable cases. The more marked the hyperplasia the more readily they are detected. Definite differences in the pharmacological activity of control and iodized thyroid lobes can be detected as early as the eighth hour. This difference becomes well marked by the twentieth hour. These facts indicate that morphological changes are closely related in time and are dependent upon the elaboration of the iodine containing hormone and that the generally held view that involutionary changes in the gland are the results of a decrease in functional activity of the thyroid cells and a storage and an increase of the pharmacologically active principle—the iodine containing hormone—in the gland is essentially correct.

The storage of iodine in the thyroid from salts of this element is practically instantaneous, while the elaboration of the hormone is slow. Comparisons with the rate of formation of other physiologically necessary substances of a comparable nature are at present not possible. In the case of the suprarenal gland recent evidence suggests that epinephrin is probably formed more rapidly.

Whatever the rate of formation of the active substances of other ductless glands may be, it is probable that in the case of the thyroid it is relatively slow since after thirty hours only a small fraction of the iodine taken up in as many seconds is transformed into the specific hormone.

Variations in the rate of formation of the active substance when taken in connection with the normal occurrence of iodine in the thyroid in both an active and an inactive form suggests the physiological importance of the mother substance with which the iodine is combined and the value to further work in the fields of physiology and pathology of the thyroid which a definite knowledge of its chemistry might have.

GEORGE E. BRILAY

Macht, D. I.: Action of Opium Alkaloids on the Ducts of the Testis. *J. Pharmacol. & Exp. Therap.* 1916 ix 22

While engaged in the study of the action of various drugs on the ureter the author's attention was recently directed to the behavior toward drugs of the organ most closely resembling the ureter in anatomical structure—the vas deferens. Accordingly he carried out a series of experiments as to the effect of various pharmacological agents on that organ. Although his work is incomplete he has deemed it advisable to report at once the present status of his observations of the action on various seminal ducts, namely the vas deferens, the ejaculatory ducts and the seminal vesicles of a group of alkaloids, which have hitherto not been studied in this connection—the opium alkaloids.

Macht believes that the exact mechanism of seminal discharge is still not quite settled, and on the other hand he believes that it has been sufficiently proved that the passage of spermatozoa from the seminal tubules to the epididymis is due to the *vis a tergo* produced by increased glandular activity of the testes and constant formation of new spermatozoa. The discharge of the fluid from the epididymis onward, on the other hand he states is a muscular act, which begins probably in the vasa efferentia and the canal of the epididymis and sweeps along the powerful muscular walls of the vasa deferentia in the form of a series of peristaltic waves. The seminal vesicles at the time of orgasm also contract and the mixed liquid and spermatozoa are poured through the ejaculatory ducts into the prostatic portion of the urethra, from which Macht states, it will be seen that the action of morphine and papaverine just described is of practical interest. The stimulating action of morphine on the spermatic ducts, he states, certainly agrees with the well known fact that sexual excitement and seminal

discharges are commonly met with in cases of morphinism or the morphine habit. On the other hand, he believes that the tonus-lowering and sedative effect of papaverine and of total opium alkaloids, would indicate their use as a sedative in hyperexcitable conditions of those organs, and in the case of testicular ducts as in the case of the ureter the intestine the bladder and other organs a careful pharmacodynamic analysis of the action of the various opium alkaloids leads to a more rational employment of them for therapeutic purposes.

From his study and experiments the author believes that the effect of morphine and the phenanthrene group of opium alkaloids is to increase the tonus and contractions of the vas deferens, seminal vesicles and ejaculatory ducts and the effect of papaverine and the isoquinoline group of opium alkaloids is to decrease the tonus and inhibit the contractions of these organs. In the effect of total opium alkaloids he states, the narcotine and papaverine effects on smooth muscle predominate. These observations seem to him to hold good in the intact animal as well as on excised organs, and are of some practical interest.

GEORGE E. BRILAY

Waddell J. A.: The Pharmacology of the Seminal Vesicles. *J. Pharmacol. & Exp. Therap.* 1916 ix 3

Waddell has recently pointed out that there is an almost entire absence of pharmacological data relative to the vas deferens. In this paper are reported experimental data obtained from excised seminal vesicles of rats and guinea pigs suspended in a physiological saline solution. Only the longitudinal muscle of the former species was examined, but both the circular and the longitudinal of the latter. The drugs employed were epinephrine, ergot, nicotine, hydrastis, pilocarpine, arecoline, atropine, and barium chloride.

In all cases the organ was removed under complete chloroform anesthesia. The whole vesicle was used in the case of the rats, while a portion of one about 2 cm. in length was used in that of the guinea pigs. The tissue was transferred immediately from the anesthetized animal to an oxygenated bath of Tyrode's or Ringer's solution at body temperature.

The freshly excised seminal vesicles of the rat and the guinea pig exhibited rhythmic contractions when suspended in oxygenated Ringer's or Tyrode's solution at body temperature.

The seminal vesicles of the rat and guinea pig exhibited increase in tone and rhythmic contractions on application of epinephrine, ergot, hydrastis, nicotine, pilocarpine, arecoline, and barium chloride.

Atropine antagonized the effects produced by nicotine, pilocarpine and arecoline on the seminal vesicles of these animals.

From the above experimental data, it would be concluded that the seminal vesicles of the rat and the guinea pig possess a motor parasympathetic as well as a motor sympathetic innervation.

GEORGE E. BRILAY

Foster, C. S. and Kahn, M. A Study of the Tests of Liver Function. *J. Lab. & C. Med.* 9: 6 li, 5

The author enumerates the various functions of the liver as follows:

- 1 Secretion of bile.
- 2 Relation to carbohydrate metabolism (a) glycogen formation.
- 3 Relation to nitrogen metabolism (a) formation of urea.
- 4 Detoxication of function (a) formation of the conjugate sulphates & glucuronates (b) withholding of toxins and poisons.
- 5 The decomposition of the erythrocytes.
- 6 The formation of fibrinogen.
- 7 The formation of antithrombin.

The methods for the study of these functions are several and the following test was employed by the authors in testing the renal function:

1 A study of the carbohydrate tolerance of the liver which includes the tests of general carbohydrate metabolism tests of tolerance for special carbohydrates for example Bauer's lactose test Strauss's levulose test, etc.

2 A study of the nitrogen excretion in the urine including the urea, amino and ammonia nitrogen fractions.

3 The urobilinogen excretion in the urine which von Jaksch considered significant of liver disease.

4 Analysis of the fibrinogen of the blood which was found to disappear from the blood after liver extirpation.

5 A study of lipase and fibrinolytic ferments of the blood.

6 The phenol trichlorophthalein test.

1 Carbohydrate test of hepatic function (a) Bauer tested the liver function by administering to the patient 30 grams of galactose. The urine was then analyzed for galactose. If present the liver is not functionally proper. (b) It was used another carbohydrate—levulose—for this test. He administered 100 gm. of this substance per os and then analyzed the urine for levulose by Salmannoff's reaction.

Study of the nitrogen metabolism. It is well known that the liver plays an important role in the protein metabolism of the animal organism. Disturbances of liver function will induce deviation from the normal of the nitrogen metabolism. Rowntree, Marshall and Chesney have found a low percentage of urea and a high percentage of amino acids and ammonia in the urine of patients suffering from hepatic involvement. It is known that in eclampsia, with liver necrosis there is always a high ammonia coefficient.

3 Study of the urobilinogen excretion. Von Jaksch thought that the presence of urobilinogen in the urine was indicative of hepatic disease. The studies of Wilbur and Addis have definitely demonstrated that such is not the case. The urobilinogen is tested for by Ehrlich's para-dimethyl-amino-benzaldehyde.

4 The determination of the fibrinogen content of the blood (Whipple) and of the fibrin ferment of the blood (Goodpasture) were found to be valuable by Rowntree, Marshall and Chesney.

5 The determination of the lipase of the blood as recommended by Loevenhart has not proved of any value.

6 The phenol trichlorophthalein test. In 1909 Abel and Rowntree conducted pharmacological experiments on animals with phenol trichlorophthalein which was synthesized by Professor Orndorff of Cornell University. They found that this substance when injected intravenously was excreted in the bile. At the suggestion of Rowntree, Whipple, Nelson and Peighal it died the excretion of this substance in the bile when the liver was subjected to various lesions. They found that in dogs which had been poisoned by phosphorus, for example, the excretion of the phthalein was interfered with. It was then that Rowntree, Marshall and Chesney applied the tests clinically and obtained rather encouraging results.

A objection to the study of the function of any organ as an index of disease is that it is perhaps possible for the healthy part of the diseased organ to compensate and assume the work of the whole gland in which condition of course the functional output of the organ may be normal and would be no index of the pathological anatomy of the organ, and only marked destructive changes would leave their impression on the functional activity of the organ. It has been the authors' experience however that disturbances in the structure of the liver go hand in hand with disturbances of function. This question is now being more fully investigated and the authors hope in the near future to make a more complete report. C. OROB E. BEZLEY.

Pentimalli F. Lesions of the Thymus as Factors in the Development of Experimental Tumors. *Annali di Ist. Oncologico del R. Istituto di Studi e Cura* 9: 6 li 337

Pentimalli has made a number of experiments following the example of Roux and others who produced sarcomatous tumors experimentally by the injection of sarcomatous filtrate into the pectoral muscle etc. Pentimalli's experiments were made on chickens. The material used was the dried sarcoma of Roux suspended in Ringer fluid and injected in the circulatory system of the animals. In the injected animals a lesion by means of the thermo-cautery had been previously produced in the liver, spleen, kidney, pectoral muscle or other organ.

1 The results obtained from 5 experiments showed that the inoculation of sarcomatous trus of chickens into the circulatory system of these animals produced development of tumor selectively in the position where an alteration of the tissues was due to a previous lesion.

The tumor thus produced in every case is a fusocellular sarcoma even when an epithelial organ

(liver skin) has been injured. This demonstrates that of all histologic elements proliferating after a lesion, epithelial elements are not capable of resisting the abnormal stimulus of sarcomatous virus which act indifferently on mesenchymal and mesodermal cells.

3. Tumors thus produced are demonstrably true tumors not only on account of their histologic structure but also by the biologic proof of their transplantability into other animals.

4. From these experiments it seems that it may be admitted also that there is a period in which the elements of various organs capable of being affected by the action of the virus do not equally resist this action. Thus while from the young cells of the subcutaneous tissue a tumor is developed even when the virus is brought in contact with them after six days the connective tissue elements of the liver after this time and even after four days do not give origin to a tumor.

W. A. BRECKMAN

Lambert, R. A. *Technique of Cultivating Human Tissues in Vitro*. *J Exp Med* 9 6 xxiv 367

The author for the purpose of cultivation of human tissue *in vitro* prepared a medium by mixing a small quantity of chick plasma with a considerably larger quantity of human serum. In this medium liquefaction of tissues did not occur. The tissues removed at autopsy several hours after death were cultivated the preparations showing in some instances a very active growth of connective tissue cells. They did not find it necessary to make transfers to fresh plasma oftener than every five days.

From his experiments the author found that unmodified human plasma is not a satisfactory culture medium for human tissues, owing to the susceptibility of human fibrin to digestion by tissue ferments. The necessary framework is thus destroyed before the cells begin to migrate. The difficulty can be overcome, he states, by adding to human plasma or serum a small quantity of fowl or pigeon plasma the fibrin of which is highly resistant to digestion. Human tissues have been propagated in this medium for several months through subcultures and growth *in vitro* can probably be maintained indefinitely, he believes.

Human tissues show no greater sensitiveness to changes in temperature and mechanical injury as associated with preparation of cultures than those of lower animals. They may be preserved in an ordinary ice box at 10 to 15° C as long as six or eight days. Tissues obtained at operation give best results but pieces of organs removed at an autopsy one to four hours after death sometimes show active growth.

The presence of normally existing iso-antibodies (agglutinins and hemolysins) in human serum is without influence on the growth of human tissues *in vitro* and autogenous serum has no advantage in tissue cultures over homologous serum. In the opinion of the author

GEORGE L. BRIDLEY

Pottenger J. E. Some Technical Difficulties Involved in the Comparison of the Diazo and Urochromogen Tests. *J Lab & Clin Med.*, 1916 II, 3

The remarkable sensitiveness of the urochromogen reaction as compared with the diazo reaction reported by some workers the author states is due in large part to failure to exclude the normal transient reactions found in normal urines and to a hesitancy in recording slight diazo reactions.

The urochromogen is somewhat more sensitive than the diazo if the pink foam alone is considered in determining the presence of the latter it is equally sensitive to the diazo if compared with all reddish reactions in the solution of the latter and less sensitive than the diazo if all questionable reddish solution reactions and those with deep brown foam are added to the latter.

The difference in color tone and permanency of reactions affected by various proportions of reagent and urine in performing the urochromogen test makes it imperative that the test be standardized.

The diazo reaction, if studied carefully as to color tone of both foam and solution will give considerably more information than the urochromogen gives.

In view of the prevailing confusion in the matter of technique the author states it seems too early to draw conclusions as to the relative prognostic values of the two reactions.

GEORGE E. BRIDLEY

RADIOLOGY

McRae, J. D.: X Rays and the Living Cell. *J Fla M Ass* 9 6 lii, 09

The author reviews briefly the knowledge which physicists have obtained of the X rays, and also mentions the changes which are produced on the various tissues by varying exposures to the roentgen rays. Some original work was done with various garden seeds. Dry seeds were first exposed to the rays for one hour and it was found that when these were planted, the behavior of both the treated seeds and the control seeds was the same, i.e. the time of germination and vigor of both was identical. However after permitting the seeds to germinate and then exposing them to the action of the rays it was found that the treated seeds germinated much earlier than the controls. In this way it was demonstrated that a certain amount of exposure to the ray produces stimulation.

This stimulating action of the ray on normal cells was further demonstrated by the treatment of a fundus-like mass on the forearm. Here the malignant cells were destroyed, and there was very evident stimulation to the growth of the normal cells.

The author refers to the experiments on the larvae of beetles and other insects. The several theories which have been propounded to explain the cause of the changes produced by radiation are given but no new explanation is advanced.

W. A. EVANS.

Quimby W A Roentgen Ray Therapeutics.
 N Y M J 9 6 cl 63

The author advances the theory that a considerable amount of the therapeutic effect from X radiation is brought about through a leucocytosis, local and general the result of such radiation. The local leucocytosis is the natural result of irritation and is increased by a dilatation of the blood vessels which is in turn due to a direct action of the X ray upon the nerve-endings. The general leucocytosis is a constitutional manifestation of a local reaction and is further stimulated by toxic waste products engendered through disintegration of diseased tissue. The favorable effect observed upon secondary malignant growths when radiation is applied to the primary growth only is no doubt due to this general leucocytosis.

The author believes that X rays affect the human organism by producing chemical changes in the molecules of the body cells. Under ordinary conditions the application of X rays produces no sensation. If currents of very high voltage are used in the production of the rays, the patient experiences a sensation of warmth and exhilaration and may even perspire freely, these effects being due to a rise in blood-pressure. If relatively low voltage currents are used, the blood-pressure falls and a tendency to drowsiness occurs.

The authors have used for many years tubes demanding 80,000 to 100,000 volts to actuate them. This places the patient in an electrostatic field which extends for several feet around the tube. One result of this method of treatment is that enormous doses of X rays can be given without filtration and without injury to the skin. A great portion of the danger from burns both to the operator and to the patient can be eliminated by maintaining a field of very high tension current surging around the tube. Prolonged exposures continuing day after day for months have been given by this method without producing dermatitis. Where large doses of X rays are being administered it is wise to pay careful attention to the excretory functions keeping the bowels open, etc. High tension electrical applications, massage, and light baths are often useful agents and have several times promptly controlled what appeared to be dangerous X ray reactions. Bathing the exposed parts in the alkaline lotion suggested by Dodd of Boston is also sometimes of benefit. G W Garra.

Blumenthal F The Biological Effect of Roentgen Rays on Mice (Ueber die biologische Wirkung der Roentgenstrahlen auf Mäuse) *Deutsche med. Wochenschr.* 1916 XIII, 1 84

From his experimental researches Blumenthal finds that in the use of hard rays, as applied at the present time in deep ray treatments, with relatively small doses an enormous damage is caused to the organism of the mouse, so that death results in a short time. Unfiltered rays of a high degree of hardness act even more destructively upon the

mouse organism than rays of a lower degree of hardness.

In the application of different ray spectra of equal degrees of hardness, the action of that particular spectrum which contains a larger amount of hard rays is stronger. The hardening of a spectrum in one and the same tube by filtration of different thicknesses is found to cause an increase of the harmful action of the rays in proportion to the degree of hardness of the rays. If this hardening over steps a certain limit a further increase of the harmful action of the roentgen rays does not occur on the contrary a diminution is observed in the action of the rays upon the mouse organism. This is explainable by the fact that the rays have become so penetrating that only a slight part of them are absorbed and consequently there is a slighter total effect on the organism. Doses which are sufficient to kill a mouse in a short time are somewhat smaller than the doses which are usually employed in one sitting in the deep treatment of a human subject. Of course it is not possible to compare animal experiments with the therapeutical ray treatment of the human subject. The fact that the entire organism of the mouse is exposed to the action of the rays, whereas in therapeutic practice only small parts of the human body are exposed changes the whole situation.

Moreover even in the employment of larger filter-strengths and harder tubes, absorption is effected only in the upper layers in the human subject whereas in the mouse they reach the vital organs. The endeavor to attain still harder rays will finally reach such a point that it will necessitate much greater care in the treatment of patients, because even now it is occasionally evident with larger dosage especially in the deep treatment, that there is an appearance of general toxic disturbance and frequent cachexia. This up to a certain degree is probably referable to the harmful action of the rays.

W A. BEYERKAMP.

Cook, P H.: Roentgentherapy in Hypertrophy of the Thymus Gland *Bosn M & S J* 19 6, clxxx 453

After fully discussing the anatomic and physiologic changes that take place in the development of the human being during the developmental stages and contrasting them with the changes that take place in animals where the gland is artificially altered Cook calls attention to the fact that the roentgentherapist should be especially successful in the treatment of pathologic conditions in this organ as the rays naturally would cause an artificial atrophy of similar glandular structures. While the symptoms produced from an enlarged thymus were recognized by physicians early in the last century it was not until a few decades ago that recommendations were made for relief. They depended upon some surgical procedure for either the partial or total removal of the gland, which necessarily was of a grave nature. Before considering treat

ment a positive diagnosis should be made and to aid, a good roentgenogram is of utmost value in confirming other methods of physical diagnosis. When it is considered that in a young infant the critical space of Grawitz is less than 2 cm in diameter the difficulties are easily realized and too much dependence must not be placed upon them they must co-ordinate with the symptoms which are more or less typical. The various surgical procedures having had a rather high mortality deterred many from taking advantage of these methods, this naturally gave rise to the introduction of roentgenotherapy. Its success has been emphasized by the remark of a celebrated French surgeon.

For over a year I have not had a thymectomy and have not yet been disappointed in radiotherapy. The only argument left in favor of some surgical procedure is the immediate relief afforded the patient. However cases have been recorded where symptoms were relieved three and one-half hours after the application of the roentgen rays furthermore there are many other reasons that appear to favor the roentgen rays. Lange has tersely stated them in the conclusions of his article upon this subject.

1. Roentgen irradiation of the thymus produces artificial involution of the gland.

2. Roentgen therapy is the method of choice in cases of enlarged thymus in children whether the symptoms be mild or urgent.

3. Urgent cases should receive repeated massive doses.

4. Recurrences due to regeneration of the gland are to be watched and controlled by further treatment.

5. Children whose physical or mental development is retarded should, if suspicion is directed toward the thymus receive tentative roentgen ray treatment even though a positive diagnosis cannot be established.

6. Roentgen ray therapy as a precautionary measure, or pre-operative treatment may enable children of the so-called lymphatic type to withstand intercurrent disease or anesthetics, which would otherwise prove fatal.

7. Pre-operative exposure of older children and adults, where there is a suspicion of enlarged thymus, might lessen operative mortality.

8. Routine pre-operative roentgen ray treatment in the cases of hyperthyroidism should be resorted to with a view to lessening the operative mortality.

9. Roentgen ray exposure of the thymus gland has been proved harmless whether in normal or abnormal individuals. A therapeutic test with the roentgen rays is therefore always permissible.

The author reports three cases. The relief afforded in these cases cannot be questioned. Lincoln in his discussion reviews the question from the standpoint of types and anaphylaxis pointing out that certain foods or food products brought into the system of certain individuals will produce certain

complex symptoms such as asthma, while in others certain disturbances of the skin will follow as eczema or urticaria.

W S NEWCOMB

Pirle, A. H.: Localization of Bullets and Shrapnel Balls by One Radiograph on One Plate. *Arch. Radiol. & Electrotherap.* 1916 xxi, 137

Pirle refers to undeformed projectiles and assumes from his experience that in the present war they are of uniform size and shape. While the length of the bullet casts a variable shadow according to position, the diameter of the bullet always casts the same length of shadow at the same distance from the plate. Pirle, therefore, makes a key-plate for bullets another for shrapnel balls by radiographing each at intervals of one half inch between one half inch and six inches distal from the plate, and is then able, by comparison with the key plate, to say from the size of the shadow at what distance the projectile in question is from the plate. Longer experience gives the ability to accurately estimate this distance by the comparative sharpness or blurring of the shadow. When desired the other required directions for localization can be obtained by cross-wires upon the plate with the focus point of the tube at a given distance directly vertical to the intersection of these wires. With this vertical, and the distance of the shadow of the bullet from the shadow of the cross-wires, and also the distance of the bullet from the plate known the required measurements are easily found by triangulation. DAVID R. BOWEN

MILITARY SURGERY

Mercadé, S. The Extraction of War Projectiles (L'extraction des projectiles de guerre) *Rev. de chir.* 1916 i 697

Mercadé thinks that a projectile should not be removed under the following conditions:

1. If it is perfectly tolerated by the tissues and does not cause any functional detriment.

2. If the size of the projectile is so small that the search for it is liable to fail.

3. If the situation is such that the projectile can only be reached after very considerable opening up or that such causes risk to the patient.

4. If the general condition is such that the presence of the projectile is secondary.

Generally speaking muscular and bone tissue gives good toleration to a projectile. It is only when it is lodged in spongy tissue that osteitis and pain as a rule arise. The tissues become accustomed to the presence of small projectiles. W. A. BRENNAN

Quénu, E.: Piece of Shell Weighing 385 Grams in the Dorsal Region (Gros éclat d'obus de 385 grammes dans la région dorsale) *Bull. et mém. Soc. de chir. de Par.* 1916 xlii 2707

Quénu cites the case of a soldier from whose dorsal region a piece of shell 21 cm. long and weighing 385 grams was removed. The projectile entered the left posterior scapular region causing fracture

zone around the wound and gas bullæ may be observed discharging gas. Although the symptoms intensify there is never any clinical gangrene. Death usually occurs from thirty to fifty hours after injury.

Gaseous gangrene has a lesser gravity than gaseous septicæmia and is amenable to surgical treatment. This does not in general manifest its presence till the third day. The characteristic signs are œdema, foul gas, blackish sphacelated plaques more or less large and deep about the wound or in the whole injured limb segment. Clinically this form may be subdivided into gaseous œdematous or gangrenous according as the particular symptom predominates. Early amputation is the only treatment for an established gaseous gangrene.

Local gaseous infections are sometimes characterized by the early appearance of gas about a wound with no tendency to diffuse. There is no general reaction. The pulse is not modified and this alone will distinguish this affection from the other clinical varieties of gas infection. The usual wound clearing and drainage generally causes this local gas infection to disappear. W. A. BRENNAN.

Henry H. and Elliott T. R. *The Morbid Anatomy of Wounds of the Thorax. J. R. v. Army M. Corps 1916 xvii, No 5*

In this carefully prepared paper the authors have brought out a number of very interesting facts for the military surgeon. The material was collected from 100 autopsies after wounds of the chest. The patients died on the third day and as late as the third week but the bulk of the cases were brought to autopsy between the second and third weeks.

After considering the classification of wounds of the thorax which adheres to the conventional division of penetrating and non penetrating wounds of this region, the authors discuss the cause of death which is attributed to injury to the spine and cord in 6 cases, to hæmorrhage in 4, and the remainder were directly and indirectly due to sepsis, from one source or another. There were 78 cases of hæmorrhage and it was from these that the 4 deaths due to hæmorrhage occurred. Of the cases of hæmorrhage 60 became infected and death in these was directly due to sepsis. Three deaths are recorded as due to purulent capillary bronchitis as a complication of septic hæmorrhage. Secondary hæmorrhage comes in as a cause of death in 3 cases, all of which were septic. The hæmorrhage occurred in the pleural cavity in two cases and death followed an extensive hæmoptysis, bleeding taking place in the respiratory tubes.

As an explanation of the fluid in sterile hæmorrhage the authors state that this is dark in color and resembles ordinary venous blood. It shows no sign of clotting and may remain fluid for an indefinite time outside the body. As the blood begins to flow from the wound in the pleural cavity it clots rapidly but the clotting is not massive as is seen in a test tube outside of the body because the

cardiac and respiratory movements whip the blood during the coagulation process so that the fibrin is separated from it and deposited in layers of varying thickness on the parietal pleura and that part of the lung which is covered by the effused blood. At first the layers of fibrin are easily detached from the serous surfaces, but later they are organized into firm adhesions. The deposition and organization of the precipitated fibrin are at first an advantage and later a distinct disadvantage to the patient. At first the deposit seals the wound in the lung and again it subsequently prevents the spread of sepsis from a damaged and infected respiratory tract into the pleural cavity. Later the organized fibrin may cripple the chest by preventing the expansion of the collapsed lung by forming adhesions and by obliterating the normal pleural recess along the posterior and lateral margins of the diaphragm.

The fluid in the pleural cavity consists of blood serum with the usual cellular elements of blood and though it resembles blood closely it has no power to coagulate since it contains no fibrinogen. On centrifuging this fluid gives a deposit of red cells with a clear overlying serum which does not clot on standing or on the addition of fibrin ferment. When an inflammatory pleural exudate is later thrown out the fibrinogen of this exudate will cause coagulation within the pleura, or the fluid may coagulate on standing which is called a secondary clot.

The largest amount of fluid in a sterile hæmorrhax seen at autopsy was 4.5 pints in septic hæmorrhax 6 pints have been found the excess being due to inflammatory pleural exudates. Again hæmolytic may occur in apparently aseptic cases coloring the serum from hæmorrhage with the resulting oxyhæmoglobin or methæmoglobin. The real cause of the hæmolytic is unknown to the authors.

The following observations are of particular interest. Among the changes in the part of the submerged lung are collapse, loss of air and fleshy consistency which are first noticed in the basal portions. The collapse is rapid much more so than in the case of pleural effusion. Collapsing of the lung arrests hæmorrhage if the area of collapse and wound are coincident, and as proof of this the largest examples of hæmorrhage noted at autopsy resulted from wounds in the lung apices. A further advantage of collapse is that it prevents the spread of inflammatory bronchial infections through the immobile area.

Pneumohæmorrhax There was no case of simple pneumothorax without effusion noted in the 100 cases studied but there were 12 cases of pneumohæmorrhax cases in which gas or air was present in the pleural cavity together with blood.

The development of free gas from the growth of anaerobic bacilli is much more common than leakage of air into the pleural cavity. To distinguish the existence of pneumohæmorrhax from leakage of air into the pleural cavity through a wound in the external thoracic wall, or from a leak in the respira-

tory tract on the one hand, and from the generation of gas from the growth of anaerobic bacilli on the other the terms exogenous and endogenous are employed by the authors. The term exogenous pneumothorax refers to the origin of air from a leak of air into the pleural cavity from the external thoracic wall etc. while the term endogenous pneumothorax refers to the form in which gas develops from anaerobes which have infected the blood in the pleural cavity. The latter variety is much more common. Of the 12 cases observed at postmortem were of the endogenous variety. They are characterized by the development of a very offensive smelling gas resembling that of sulphurated hydrogen. It may accumulate under considerable pressure so that when a small cannula is introduced at autopsy into the collection of gas, the latter escapes rapidly and burns with the characteristic bluish flame when lighted with a match.

The gas is free in some cases above the septic blood in which it is generated, or it may be fixed in position by adhesions, or it may be imprisoned in the midst of the infected hæmorrhage.

Injury to chest wall. Of 60 cases in which the penetrating missile was identified 55 per cent resulted from bullets the remaining 45 per cent were due to shell fragments, shrapnel balls, pieces of grenades and bombs. There was not a single bayonet wound.

Origin of the blood in hæmorrhage. Those who have been taught that the source of hæmorrhage causing hæmorrhage is of parietal origin and most often from an injured intercostal vessel. It is in the nature of a surprise to learn that in the great majority of the 78 cases of hæmorrhage noted the blood was derived from vessels in the lung. The painstaking details which have led to this conclusion are in themselves proof of the value of postmortem work as to the cause of death from battle wounds, a subject so long neglected.

There is no question about the occurrence of visceral bleeding in the pleural cavity which is no doubt a frequent cause of death from injury to the hilum of the lung and the larger pulmonary vessels. But the visceral bleeding of clinical origin which forms a pool of blood in the pleural cavity known as hæmorrhage is derived from the smaller lung vessels. It would seem after all that the pulmonary origin of the hæmorrhage under discussion is a phase peculiar to the characteristic features of the war wounds of today and that the war wounds of the Spanish-American, Anglo-Boer and Russo-Japanese wars were so totally different, in lung tissue that they give no data of value for a study of the etiology of hæmorrhage now. It should be remembered that the ogival headed, steel jacketed reduced caliber bullet was used by all governments in the wars mentioned. This was a well-balanced bullet which usually entered the body point on, and its humane features were proverbial in striking soft parts, the joint ends of bones and the lung tissue. The channel which it made in non-resistant structures seldom

exceeded its own caliber. In the elastic and practically homogenous lung tissue it made small even tracks. A perforation from such a bullet in lung tissue was attended with little more risk than a puncture from an exploring trocar.

The change in the armament of the nations in the last ten years has upset all of our happy calculations on the subject of humane wounds. As far as rifle bullets are concerned and they include machine gun bullets, the projectile is now pointed shorter and much lighter. It travels with added velocity and it is proverbially unstable so that the least resistance causes the bullet to turn at a tangent to its line of flight and butt end to at times. The wound that it causes no longer has a smooth channel. It is more apt to be irregular and ragged even in soft parts like lung tissue. The entrance and exit wounds in the pleura are large and the opportunity for hæmorrhage in the pleural cavity is much greater. The next change in the armament which has caused marked difference in the character of lung wounds is the extensive use of high explosive shells. Although used primarily for stationary and large siege guns the high explosive shell is now used with good effect on the field in the 77 and 75 guns of the mobile artillery of the French and Germans in battering down barbed wire entanglements and other obstructions used against the advance of troops. The shells burst into many irregular fragments of varying sizes. The large fragments cause lacerated wounds which contain much dirt lacerate tissue and which are hard to treat.

There is also a change taking place in the use of a high explosive shrapnel in lieu of the common shrapnel that adds to the severity of all wounds. The high explosive shrapnel is used against personnel and material and it answers well the objects of both projectiles. When it is desired to use the projectile as a shrapnel it is made to explode by a time fuse in the air in front of the enemy. When used as a high explosive shell the time fuse is not set, and it is allowed to explode on impact.

At the beginning of the present war ammunition was issued to the 75 French gun in the proportion of one-half shrapnel and one-half high explosive shell. On account of the superior efficacy of the latter the manufacture of shrapnel has been discontinued. The use of shrapnel balls had been bad enough but a combination of shell fragments and shrapnel balls is far worse.

It is to this change or rather these changes that Henry and Elliott refer when they dwell on the severity of the lung wounds in this war which are so prone to be followed by bleeding from lung tissue into the pleural cavity.

The authors conclude their valuable paper with the following summary.

Of the 100 deaths analyzed 66 were directly due to septic poisoning. Only 4 died from hæmorrhage and 3 of these were cases of secondary hæmorrhage induced by sepsis.

2 Bruising and laceration of the lung was found around the wound tract in nearly all the cases. The source of the hemorrhage in the pleural cavity seemed as a rule to have been from vessels in the lung.

3 Laceration was not a serious lesion when accompanied by a hemothorax but in the absence of the latter it was liable to form the starting point of a septic bronchopneumonia which being unchecked since there was no collapse of lung spread quickly and proved fatal.

4 Ordinary lobar pneumonia was never observed on the side of the injured lung and it was found in the contralateral lung in only 3 cases out of 78 that developed hemothorax.

LOUIS A. LA GARDE

Depage, A. Bacteriologic Control as an Indication of Suture of War Wounds (Du contrôle bactériologique comme indication de la suture des plaies de guerre) *Bull et mém Soc de chir de Par* 9 6 xlii 1987

The Carrel method with wide clearance and resection of contused tissues, has been used in the treatment of war injuries in Depage's ambulance since September 1915. The transformation effected in results has been remarkable. Immediate complications became more and more rare and suppurations disappeared almost completely. However it was not possible to judge correctly of the value of the method until the evolution of the wound was followed by bacteriologic control which Depage considers a necessary complement of the Carrel method. This control was systematically established June 1 1916 and consisted in the regular determination of the microbial contents of the exudate obtained from the wound.

Laboratory observations in the first six days after injury show that the exudate is essentially constituted of polynuclears with an enormous number of microbes. About the sixth day the polynuclears tend to disappear and are little by little replaced by mononuclears the microbes diminish in number concurrently. After the tenth day macrophages appear and only a few bacteria are found incorporated in phagocytes. The appearance of macrophages in the exudate is a favorable sign of approaching asepsis.

A wound thus aseptized by the Carrel method becomes rapidly reinfected if the treatment is suspended. In the infection of a wound observation shows three periods:

1 A period of acute infection during which microbes are very abundant and show a maximum degree of virulence. A suture made in the course of this period would be regularly followed by failure if not by serious complications.

2 A period of attenuated infection, in which the microbes are less numerous and less virulent. Suture at this time only occasionally succeeds and it may reawaken microbial virulence and favor return of acute infection.

3 An aseptic period which gives the suture every chance of perfect reunion and in which it is always prudent to wait two or three negative examinations before suturing osseous lesions, and in fractures particularly a long time should be allowed to elapse before closure of the wound.

Since June 1 1916 in Depage's ambulance 137 secondary sutures have been practiced in 108 wounded all under bacteriologic control. Some of these sutures were made before asepsis was sufficiently established but in no case whatever has there been any complication retarding recovery.

Of the 137 cases 112 were complete successes the reunion being perfect over the complete extent of the wound without any inflammatory reaction. In 23 cases the success was partial a few of the stitches giving way either on account of skin necrosis or slight suppuration but in these cases the sutures were generally made in spite of contradictory indications of microbial contents. In these cases sterilization was effected by the use of Dakin's fluid. In two cases only did the sutures fall in both of which, however suture should not have been made owing to exaggerated tension. Both recovered rapidly under treatment.

Of the 137 sutured wounds 102 were of the soft tissues. These gave 82 complete successes 19 partial successes 1 failure. 6 articular wounds gave 5 complete successes and 1 partial success. 12 amputation stump wounds gave 10 complete successes and 2 partial successes. 17 fracture wounds gave 15 complete successes 1 partial and 1 unsuccessful.

W A BRENNAN

Bazy L.: Treatment of War Wounds (Traitement des plaies de guerre) *Bull et mém Soc de chir de Par* 916 xlii, 1930.

Bazy gives his experience based on thirteen months of war surgery at the front. The treatment of wounds is based on two important facts: (1) that a wound does not reunite by first intention if it is infected, and (2) that a wound only ceases to suppurate when all decomposed substance connected with it has been removed. Not only must foreign bodies and debris be removed but all tissue incapable of revivification in the body must be cut away. This surgical treatment of wounds is the essential primordial procedure.

In the further treatment Bazy has long ceased to use ordinary antiseptics, owing to their harmful effects on the tissues. He has substituted the perfected non-cytotoxic antiseptics of Dakin and Duret and has obtained excellent results. At the present time in the case of wounds which he is obliged to leave open and which cannot be united at once by sutures, he prefers to use Vallée's serum. From this he has obtained the best results. He also uses magnesium chloride. This he considers a marvelous preserver and a marvelous excitant of the vitality of the tissues but it must be used with discernment according to the indications. All these chemical agents however are only aids to the

surgical treatment which is and must remain the essential procedure, without which sterilization procedures alone will be ineffective.

W. A. BRIDGMAN

Gaudier H. and Montaz, R. *The Primary Immediate Suture of War Wounds* (*De la suture primitive immédiate des plaies de guerre*) *Lyon chir* 9 6 xiii, 685

The authors resume the discussion of the general question of the immediate closure of war wounds. Although in immediate closure there is risk of infection the authors think that when resorted out under well-defined indications and with careful technique immediate suture is not dangerous. In their first cases this procedure was confined to injuries of the soft parts, but later the success obtained encouraged them to extend this to fractures whether articular or not.

The authors believe that immediate suture of war injuries rests on precise anatomophysiological basis and that it can be carried out in a great number of cases without any risk to the wounded but in very special conditions. These conditions are precocity of intervention, excision as complete as possible of all eroded tissue after removal of the projectile and all associated foreign bodies, perfect hemostasis and the possibility of watching the wound during the first days. In many cases the first and last conditions are not realizable, and the authors think that in such cases it is better to have recourse to dressings with or without antiseptics and to defer the suturing of the wound until circumstances admit of it.

W. A. BRIDGMAN

Fehling, H. *The Treatment of War Injuries* (*Über die Behandlung bei Kriegsverletzungen*) *Beit. Klin. Chir.* 9 6 Kriegschir. Heft

Fehling as chief surgeon in one of the large base hospitals gives his experience in the treatment of war wounds since the beginning of the present war. The experiences gathered before this present war led him to hope that wounds would progress without fever and reaction under aseptic treatment. Conditions in the present war are, however, very different from those prevailing in previous wars owing to the larger proportion of artillery projectile wounds.

In the early days of the war patients reached the hospital from the front with foul-smelling infected wounds, and sometimes maggots were found beneath the bandages. Under expert treatment fever was reduced in the first week while in small-arm injuries only about 10 per cent showed fever. In grenade and artillery wounds this number increased to 50 per cent. Von Bergmann's principle, to leave the first bandaging on as long as possible, could not be followed in many cases at the beginning as frequent change was found necessary. Von Bergmann's advice not to disturb smooth through wounds, especially of the soft parts, and to leave the first dressings on as long as possible, if there is no fever, is not to be contested but in the large number of

grenade and artillery injuries there is a more rapid and extensive tissue necrosis than in smooth bullet wounds and germs easily find a field of nourishment. If tetanus or gas-gangrene microbes are present the danger of infection is much greater.

Carrel's method of opening up widely and removing all spill tears etc. in feverish wounded is rational if carried out by a skilled surgeon and when not contradicted but it is doubtful if it is advisable to recommend such surgical procedures to those not accustomed to use them. The frequent fevers and suppurations have led many to the view that asepsis is useless; they have therefore resorted to antiseptics, in Fehling's opinion without reason. While an aseptic dressing is no protection in infected wounds, under antiseptic treatment the wound conditions are no better.

Fehling's experience with antiseptics excepting collargol is unsatisfactory. The action of collargol is catalytic and it brings about a strong hyperleucocytosis. Fehling practices in gynecological and obstetrical surgery. Fehling has had remarkably good results from the use of collargol as a cleanser and disinfectant. He has found similar good results from its use in surgery.

With regard to the use of drain tubes. In abdominal operations and suppurating peritonitis, it is necessary to keep the wound open by means of large drains to permit the discharge of secretions, the same holds in the opening and treatment of bone injuries. But in the treatment of soft part wounds, drain tubes, both small and large have proved very unsatisfactory. The drain tube prevents the wound tract from closing. It keeps the wound edges apart and as a rule after the drain is removed pus makes its appearance. The drain tube contrary to the rule of gravity does not help the pus to pass out. Where it is desirable to keep the outer opening open, it is much more expedient to keep the wound tract open by means of gauze strips, soaked in sterile salt solution, or other non-irritating antiseptic solutions. Such capillary drainage is very effective.

Wright has recommended the stimulation of wound secretion by the use of bandages kept soaked in hypertonic salt solution, washing away the microbes and the wound secretions. By the advice of von Brun, Fehling tried the Wright method in a number of cases. He did not notice any especially favorable action upon the tissues, nor a quicker elimination of the infection nor less fever and has therefore ceased using it.

Regarding the antiseptic method of Carrel and Dakin, as the frequent necessary handling causes much disturbance to the wound and to the patient, Fehling has not tried this method. Fehling thinks the passive suction treatment of Bler is more rational. Suction treatment benefits by extracting pus from cavities, and the induction of edema and subsequent contraction.

In the after-treatment of war injuries suction treatment is appropriate in a number of cases.

This is especially the case in trunk wounds with a downward extension where a counteropening is impossible and also in wounds of the extremities where the pus descends into the musculature, etc. and where a counteropening is only possible after separation of much sound tissue. Irrigation of such wounds has long ago been given up as unnecessary and harmful, as by this method germ-containing secretions get into the tissues.

Fehling in the application of Bier a method uses different kinds of glass-globes, small and large, round and oval. As a rule, pain is experienced only on the application of the globe as soon as the suction is over the pain is slight or disappears. The suction treatment is contra indicated if inflammatory processes exist or if fever is present.

Open wound treatment is a further advance in war surgery. This method is not used in minor injuries which usually heal with dry scars, nor in incised wounds which can be closed by suture but it can be used in all large, ragged necrotic wounds especially bone injuries, and also in wounds which are badly infected. The pain caused by removal and renewal of bandages is avoided there is less opportunity for the development of pathogenic microbes and the method of treatment is comparatively inexpensive. The main advantage is that the patient does not suffer pain from the changing of bandages his fear of the surgeon is gone. The difference was especially striking when wounded from outside hospitals were received who had been treated in the old way. There was a quick change, secretions soon dried up and a yellowish scab covered the wound. This scab is left untouched as long as possible, is then removed with great care and is followed soon by granulation. It is rare that inflammation appears, causing a temporary change of treatment. If abscesses should form after incision, a dry bandage is applied for a few days, then the open treatment is again instituted. Contrary to Lister's antiseptic method excluding air from the wound free airing in open wound treatment has evidently no drawback even if the air in the hospital wards contains suspended staphylococci and streptococci. The air is filtered through the gauze net. The danger of the patients touching their wounds is not great. There is one disadvantage, which happens now and then which is that the gauze strip filled with secretions may cause an irritation of the skin in the neighborhood. In injuries of the extremities open treatment was used most frequently with or without fixed bandages, also in injuries of the trunk, but rarely on the head.

Fehling is not in a position to make a statistical comparison of the advantages of the open wound treatment and thus prove better results and quicker fever reduction in openly treated cases. Unprejudiced observations alone can decide this. It is understood that in open wound treatment aseptics must be observed. If this is observed the method is likely to come into competition with the anti septic Listerian surgical conception.

From this point of view open wound treatment is to be considered as an advance not alone in war surgery but also in times of peace. Fehling concludes with the opinion that aseptic methods in present war surgery have not suffered so much as the many publications on the subject lead one to believe it is only necessary to alter the procedures to suit existing circumstances. W. A. BRENNAN

Hornus, G., and Perrin P: Treatment of War Wounds by the Carrel Method (Traitement des plaies de guerre par la méthode Carrel) *Rev de chi* 9 6 L 637

The method adopted by the authors since February 1916 in the treatment of all wounded (except those in a state of shock or with very extensive hemorrhage) is to open up the wounded tract widely with mechanical clearance of all foreign or bone fragments and chemical treatment by the constant application of Dakin's fluid. They think that healthy tissues resist the dissolving action of Dakin's fluid. The dressings following the first intervention are kept constantly saturated. One hundred and twenty-one wounded have been thus systematically treated between February and April 1916. Between the sixth and twelfth day all wounds so treated no matter what their size or condition are sterilized. In fifteen days or often even in seven days mortified tissue is eliminated the wounds have a good aspect and can be sutured.

W. A. BRENNAN

Penhallow D P: Military Surgery Oxford University Press London 1916.

In his book which is destined to take rank among the leading works which deal with war wounds, Penhallow graphically portrays the projectiles and the wounds they have caused in the present world war. His opportunities have afforded him a rich experience and the arrangement of the matter at hand is excellent.

The part of the book which deals with wounds is devoted entirely to the traumata from projectiles and not from swords or bayonets. The latter are so rare that they form a negligible quantity notwithstanding the accounts of hand-to-hand encounters which are frequently seen in the press. In these struggles the combatants are nearly all killed and this may account for the few cases of bayonet wounds found in hospitals.

The excellent condition of the men in the present trench warfare when wounded is commented upon. This is in marked contrast to the condition of men in active campaign who may have been exhausted by forced marches in all kinds of weather with scanty supplies of food and water. The condition of the men under the last condition has long figured as a factor in the battle mortality and in lowering the general and local resistance of the men against infection. To us who constantly picture the horrors of trench warfare it is reassuring to learn that a large proportion of gunshot wounds cause relatively

little injury and do not give rise to any great amount of shock or collapse unless the injury be extensive or unless viscera, vessels, or bones are involved.

Like all military surgeons of experience the author notes the ease with which hemorrhage can generally be controlled from projectile injury to blood vessels, and he very properly calls attention to the necessity of placing a nurse or orderly on duty over those cases where it is necessary to stay hemorrhage by the aid of a tourniquet. Carelessness in the use of tourniquets and the bad effects resulting when they are left in place longer than one hour without loosening the pressure is common in the experience of field surgeons. Unless the tourniquet is loosened from time to time and the wound allowed to bleed the circulation will be cut off and gangrene will occur. This is a difficult lesson to teach to members of the relief corps who are apt to regard all bleeding as alarming and of fatal kind. The unsurgical practice of attempting to control hemorrhage by packing the wound is very properly noted. Military surgery is the last place where this method should be practiced for the reason that the unclean bullet has penetrated a clean clothing and unclean skin, and that sepsis from these has been widely scattered throughout the tissues which are often devitalized and dotted with hemorrhagic foci, conditions which augment unduly the development of all kinds of pathogenic microbes.

Like all medical men who had not stopped to consider the effects of the energy of high power military rifles in transmitting infection in the tissues Penhallow's experience with war wounds has caused him to change his views for he states: "It was thought that with modern methods of antisepsis and first-aid dressings, combined with high velocity projectiles, infection would be reduced to a minimum. Unfortunately this has proved not to be so and the present war has taught the military surgeon many things regarding wound infection, and has also caused the reasoning man to readjust his ideas. The old notion taught by many surgeons that the fate of the wounded man rests with the one who applies the first dressing has had a great deal to do with the false hope of clean, healed bullets while inflicting a wound and the mockery of using a first-aid dressing to make a dirty one clean. Thanks to the labors of the experimenters the dangers of sepsis in all classes of rifle wounds with bone lesions especially were pointed out long ago, and the impotence of kerosene disinfectants and first-aid field dressings to in any way mitigate infection that had been projected into the wound by the projectile has been noted repeatedly."

The rôle played by the anaerobes in wound infection in the present war is interestingly told. Chief among these are the bacillus tetani and the bacillus aerogenes capsulatus of Welch. We rather regret to find an American writer from Boston, referring to the Welch bacillus, as the bacillus perfringens. Those familiar with the history of this bacillus know that Welch first reported his ob-

servations upon it in 1891 to the Johns Hopkins Medical Society and that he and Nuttall in 1892 reported in full the character of the bacillus. Fraenkel described the same bacillus in 1893 and called it *bacillus pfeiferi* or *emphysematosa*. Fraenkel's name for the bacillus could not prevail since it is a rule in biological discoveries to apply the name to an organism which has been conferred upon it by its discoverer. For that reason the name bacillus aerogenes capsulatus was commonly given to the organism until Veillon and Faber some years later described the gas-producing bacillus of Welch and called it bacillus perfringens for the first time.

The war in Flanders and northern France has brought the pathogenesis of the Welch bacillus very prominently before the medical world, and the credit belonging to the author of the bacillus aerogenes capsulatus should not be dimmed by the freakish notion of one who desires to call attention to the mechanical tendency of the organism to force itself through obstacles.

Penhallow takes occasion to state that many wounds and especially simple bullet wounds heal without giving rise to any clinical evidence of infection, nevertheless it is safe to say that all gunshot wounds are infected to a greater or less extent and that the severity of the infection depends on certain factors: (1) the amount of trauma caused by the projectile (2) prevalence of the micro-organism contaminating the wound (3) resistance, both local and constitutional.

Pyogenic organisms. The pyogenic organisms come next in importance and among them streptococcus fecalis is the most frequently found. This is ascribed to its universal presence in the terrain which comprises the intensive farming district of the western front. Staphylococci, bacillus pyocyaneus, and the colon bacillus are next found in order of frequency.

It has been noted before and Penhallow again calls attention to the lack of virulence of the pyogenic organisms in war as compared to those found in the infected wounds of civil hospitals. This may be due to the resistance of the men, but more likely it is due to the attenuated condition of the bacteria, which is acquired by remaining a long time in the clothing or in the earth. In civil hospitals, in spite of good antiseptic details, pyogenic organisms are apt to acquire virulence by accidental transplanting from host to host.

Latent sepsis. One of the phases of infection which has been pointed out in this war refers to the quiescent bacteria which remain in the tissues after healing of a wound and which may later light up into a virulent sepsis. This may be the result of lowered resistance by injury or other traumata. The author warns against undertaking an operation on any healed wound, especially those involving nerves, or about a joint or blood vessels and tendons, until the expiration of three months after the wound is healed. Likewise there is danger in too early massage and passive motion near a joint.

Attention is also called to the dangers of lighting up tetanus in healed wounds by disturbing buried tetanus spores in the tissues during secondary operations. He mentions the occurrence of local tetanus in a case where it became necessary to correct some deformity in a limb. The patient had received multiple shell wounds in October and two months later it became necessary to place the patient under ether to overcome contracture of his forearm and to correct some malposition of his leg. A week later he developed trismus.

The patient had received an antitetanic dose of serum when first injured, but his immunization had begun to disappear when the disturbance of the tetanus spores buried in his injured tissues again found pabulum to be converted into the vegetative form, throw out toxin and give rise to local tetanus. This was promptly checked by administering 1,500 units of antitoxin serum intravenously. It would have been far better to have given the patient a prophylactic antitetanic injection two days before the secondary operation as recommended in a recent issue of this journal when reviewing the present status of local tetanus. No operation should be performed on an immunized or partially immunized man among the wounded in war hospitals without preceding said operation by a precautionary prophylactic dose of antitetanic serum unless the first dose has been administered less than seven days prior to the time of operation. Immunization as a result of antitetanic serum lasts only ten days after the first injection.

The bacilli *aerogenes capsulatus* likewise may lie latent in a wound which has been thoroughly healed and later may become liberated and multiply as a result of traumatism of the surrounding tissues by operative procedure, and show all the evidence of an acute infection. Penhallow details a very interesting case of this kind as a result of an attempt to remove a lodged ball two months and one day after the receipt of the original injury after the wound had healed.

Wounds caused by projectiles. The following classification of wounds by projectiles is adopted by the author: (1) wounds by hand weapons (2) wounds by artillery (3) wounds by grenades, bombs, and mines. It is interesting to note that 55 per cent of the wounds received at the American Women's War Hospital were caused by rifle bullets. Doubtless the majority of the bullets were fired from machine guns since the same ammunition is used in machine guns as in military rifles. In the Civil War 1861-65 the percentage of wounds by rifle and pistol balls was 91:1 by grapeshot, grenades and shrapnel 8:9. In the Franco-Russian War 88:7 and 11:3. In the Russo-Japanese War Japanese 83:5 and 13:5 Russian 84:5 and 14:5. If trench warfare in Europe is now giving 55 per cent of wounds by rifle projectiles and the remaining 45 per cent of wounds are being approximately inflicted by shrapnel, shell fragments etc. this mode of warfare is so far as the percentage by

projectiles and the characteristic features of the wounds are concerned does not differ very much from that noted in the Crimean War 1853-56 during which troops fought mostly behind entrenchments. Out of 34,306 wounded among French troops Chenev reports 53.4 per cent of casualties by rifle and pistol bullets 46.6 per cent by the artillery arm.

The chapter on treatment is of much interest showing the advances that have been made in the treatment of wounds in this war. Wounds at the front are treated antiseptically by a protective dressing and lastly all wounded men are given an injection of antitetanic serum. The antiseptic used varies. The more simple wounds are painted with tincture of iodine or they may be washed with acid carbolic 1:20 or 1:40. Larger wounds may require the use of an anesthetic the tissues which are devitalized removed and the wound swabbed with carbolic acid or with tincture of iodine. Accessible foreign bodies should be removed and the vessels ligated when necessary. A wound dressing of gauze treated with bichloride of mercury is then applied.

The subsequent treatment at the base resolves itself into the treatment of (1) clean wounds (2) infected wounds.

1. The so-called clean wounds are those of soft parts by bullets or small shell fragments that usually heal readily after the application of a first-aid dressing preceded by painting the wound and surrounding skin with tincture of iodine.

2. The treatment of infected wounds at the base is invariably preceded by a bacteriological examination of the discharges from the wound.

It is the aim of the surgeon whenever possible to apply a dressing which will have a marked bactericidal effect upon the prevailing organisms and one which will penetrate into all the recesses of the wound and thus reach the foci of infection.

The next most important step in the treatment of infected wounds at the base is the establishment of adequate drainage and after that dressings, antiseptics, salines, bath compresses, fomenta, etc. The author describes in detail the methods of treatment advocated by Wright and Carrel both of which are used in the American Women's War Hospital almost to the exclusion of other methods. The author states that as to the relative values of the hypochlorous acid and saline solutions there is doubt as to which produces the best clinical results. Penhallow is partial to the use of hypochlorous acid for gas bacillus infections but in the treatment of other infectious he states: "We are still undecided as to whether we get better results with hypochlorous acid or with saline solutions though from comparative studies of the two methods we are beginning to be slightly more in favor of the saline solutions." We give the author's exact words as to his idea of the merits of the two methods which are now so prominently before the profession because his statement is one of the first which we

have seen in print on the comparative value of the two procedures.

Secondary hemorrhage. Under this important heading the author warns of the danger of digestive ferments which have such a tendency to evade vessels in infected wounds, and the danger of through-and-through drainage tubes in perforating wounds of limbs is referred to since by contact with a vessel they become more dangerous than the original missile inflicting the injury. Secondary hemorrhage should be treated without temporizing by prompt ligation. It is dangerous to pack infected wounds and especially those in which secondary hemorrhage is taking place. Violation of this rule may have given the notion that packing infected wounds with gauze impregnated with salt solution promotes a tendency to secondary hemorrhage. Gauze packing with any disinfectant is a dangerous surgical procedure in an infected wound since packing increases the possibility of spreading infection through a large area. As the infection spreads it involves the vessel coats hence the tendency to secondary hemorrhage.

The pages of this book contain many valuable illustrations showing the wonderful results which have been obtained by the use of primary and secondary suture after the plan recommended by H. M. W. Gray in the *British Medical Journal* of August 28, 1915. The treatment of infection from the *bacillus aerogenes capsulatus* (called *bacillus perfringens* by the author) comes in for special mention. An attempt should be made in the beginning of treatment to ascertain the bacteriology of every wound but the lack of such an examination should not deter any one from treating in a radical way all wounds which may be suspected of containing *bacillus aerogenes capsulatus*.

The following signs are very indicative of infection by the gas bacillus of Welch. The wound presents a dirty sloughing appearance, a dirty serous exudate escapes from it, bubbles of gas crepitation under the skin and a fecal-like odor emanates from the discharge. The adjacent tissues are reddened as in cellulitis and they are edematous and tender. There is evidence of toxemia and this is apparently out of all proportion to the apparent severity of the wound. The skin is cold, pale, and clammy, the pulse is weak and rapid, the temperature becomes higher and higher and delirium and death soon supervene.

Infection by the gas bacillus may be divided into three groups and on the recognition of this fact the plan of treatment is decided upon. They are grouped according to the following evidences:

1. A purely local infection recognized by the bacteriological findings, the dirty appearance of the wound, and the characteristic odor.

2. A wound with a spreading cellulitis, with a tendency to toxemia and other evidences just mentioned.

3. The cases of typical gas gangrene occur in wounds in which the traumatism involves distur-

bance of the circulation, like the severing of an artery with devitalization of the parts. The first and second signs are all present but greatly intensified.

Treatment of wounds infected by *bacillus aerogenes capsulatus*. As soon as the diagnosis has been made or the presence of the organism is suspected, the patient is etherized, the skin surrounding the wound is shaved and next painted with tincture of iodine. Slough, traumatized tissues, and necrotic areas should be cut away and the wound then swabbed with carbolic acid followed by alcohol or iodine. The wound is next dressed with gauze soaked in hypochlorous acid solution or chlorinated soda. If cellulitis is present all infected parts should be freely incised and free drainage should be practiced in the wound proper by the employment of rubber tubes, rubber tissue, or gauze.

Amputation by circular flaps should be performed in extensive wounds of the upper or lower limbs, and the wound should be left wide open. Wounds infected by aerobic bacteria do better when they are freely exposed to the air. Peroxide of hydrogen and other antiseptics have been used in these infections but the use of free incisions and drainage followed by continuous bathing with hypochlorous acid seems to give the best results. Later when the wound has become comparatively clean and the infection is subsiding the author resorts to the saline solution.

Boyle plate and bone-grafting. Internal splints in the treatment of fractures with sepsis has never been a popular method of treatment and until the present war it was not advocated by anyone to our knowledge. In a valuable contribution on the subject written by H. C. Lake, *British Medical Journal*, 1915, II, 42, he argues that in certain cases the method could be used to advantage. Penhallow maintains that the procedure has been too sweepingly condemned, and that under certain conditions it is justifiable. He has had fifteen cases of plating without a failure. The conclusions are:

1. A certain degree of judgment is necessary in the selection of a case suitable for treatment by plating.

2. The method is indicated in cases with marked deformity and overriding of fragments with little comminution and in which reduction and fixation in proper alignment and position can be obtained in no other way.

3. In compound fractures with much comminution in which there is no deformity and when alignment is easily accomplished the old method of immobilization, removal of loose fragments, and ample drainage may be pursued with advantage.

4. In all gunshot fractures, union and return of function are a matter of many months at best regardless of the method of treatment employed.

5. The objection that plates cause necrosis is true but necrosis takes place in the other methods of treatment as well and it is claimed that necrosis due to the presence of a plate is limited. Penhallow's own conclusions on this point are as follows:

a Even if an infection be present in the wound union will take place

b Early removal of the plate is indicated as soon as there is any callus formation and this is an important point, as callus will not form at the site of the plate, but will form everywhere else.

c Convalescence is not protracted much longer if at all than in other cases.

d Better alignment and position are obtained from the very beginning with less resultant deformity

e Adequate drainage should be established in all cases not only of the soft parts, but of the medullary canal itself

Bone grafting Antogenous bone grafts are employed successfully in cases of partial or only partial non union. The presence of the graft is supposed to have an osteogenetic effect and as a result, a firm bony union takes place within a very short time.

It is safer to wait until all healing has taken place and for some time thereafter. Otherwise the operation for the placing of a bone graft will prove a failure by lighting up latent infection.

The method used in the American Women's War Hospital is that advocated by Albee in his work on Bone-Graft Surgery the technique of which is so well known that it need not be referred to here

The chapters on head, face, neck, trunk, and head injuries afford much of value and interest to the military surgeon. We wish to congratulate Doctor Penhallow for his valuable contribution on a branch of surgery that was considered ancient history only a very few years ago

LOUIS A. LA GARDIE

Marraglio G. The Surgery of War (Appunti di chirurgia di guerra) *Riforma med* 9 6 xiii 893

Marraglio's experience derived from the examination of 5981 wounded with 6613 lesions leads him to these conclusions

1 Bullet injuries are most frequent, 57.8 per cent. There is however a noteworthy increase of artillery projectile wounds as compared with past wars, i.e. from about 24 to 42 per cent. The numbers depend on the kind of fighting. Artillery wounds increase among defenders of fortified positions.

2 Injuries of the limbs are the most frequent kind, 65.2 per cent. next in point of frequency are cranial wounds, 19.1 per cent. thoracic, 8.04 per cent. abdominal 5.4 per cent.

3 In the case of bullet wounds next to those of the limbs thoracic and abdominal wounds are the most frequent. In the case of artillery the head and face are most frequently the site of injury next to the limbs

4 Of the injuries 80.2 per cent were of the soft parts. 6 per cent cavitory injuries and 12.1 per cent skeletal. In limb wounds there is a preference for the right side of the body

5 The immediate mortality has been 3.02 per cent. abdominal cranio-cerebral, limb and thoracic injuries being fatal in the order named

The practical lessons which Marraglio has derived are summed up as follows

1 At the front only the most indispensable surgical operations should be done. Artillery wounds should be invariably considered as infected and treated by removal of foreign bodies disinfection of tract contra aperture and drainage. Abdominal injuries should be hospitalized immediately and close to the firing line.

2 To abstain from the use of antiseptics — oxygenated water should be used plentifully. Superficial projectiles may be extracted in the ambulances using rigorous asepsis

3 Trunk or limb wounds should never be sutured. Attempts may be made to draw the edges together in facial wounds not excessively contused

4 Limb injuries should always be immobilized even when there is no osseous lesion.

5 Morphia administered hypodermatically should be used freely except when specially contra indicated.

W. A. BRENNAN

Martin. Criticism of the Advanced Surgical Post (Critique du poste chirurgical avance) *Presse med.* 1916 p. 385

Martin denies some of the advantages which have been claimed for advanced surgical posts in the battle line. In his opinion these advantages are sometimes more theoretical than real. Even in some such stations the wounded do not arrive till more than ten hours after injury, when neither extensive hemorrhagic cases nor abdominal wounds can be benefited.

In an advanced active fighting section the surgical post is impractical and in a calm section it is useless if not harmful. Under no circumstances can it replace the surgical ambulance, providing the latter is sufficiently equipped both as regards the personnel and their surgical requirements.

W. A. BRENNAN.

INDUSTRIAL SURGERY

Vest W. E. Backache Among Railway Employees. *West Virg M J* 1916 xl, 121

Between January 1 and July 1 there appeared at the Chesapeake & Ohio Hospital for treatment 95 men who suffered from backache either alone or as one of the chief symptoms.

Under the term backache are included pain in the region between the inferior angles of the scapulae and the inferior extremity of the sacrum. A classification of the causes is as follows

| | |
|------------------------------|----|
| Trauma | 43 |
| Lumbago | 30 |
| Phosphaturia | 12 |
| Renal stone | 3 |
| Appendicitis | 3 |
| Relaxed sacro-iliac ligament | 2 |
| Unclassified | 3 |

In the 43 traumatic cases, there was with few exceptions no visible pathology. In the majority

of them the injury could be traced to some definite incident in the work of the patient most often lifting. Physical examination is usually negative, except that bending forward increases the pain and bending backward beyond the erect posture usually affords marked relief.

Lumbago is more or less of a wastebasket into which Vest has tossed the backaches which were probably of rheumatic origin. The chief differential point between these and the foregoing is that pain is elicited by bending the body both forward and backward.

Phosphaturia may give a severe backache. In approximately 15 per cent of the series this imperfectly understood metabolic disturbance appears to have been the underlying factor. This type of backache is not very much influenced by motion. If at all and the pain often radiates along the ureters and to the penis.

The cases of stone and sacro-iliac slip gave the usual findings and do not call for special comment.

In the cases listed under appendicitis it is not sure that the backache was not due to an excessive phosphaturia or to a phosphaturia of soft nature finding in chronic appendicitis.

EDWARD L. C. S. I.

HOSPITAL, MEDICOLEGAL AND MEDICAL EDUCATION

Insufficient Evidence of Malpractice *U. S. R.* 910 7

The suit cited arose from the following facts as shown by the testimony introduced at the trial. The plaintiff while a patient in a maternity hospital was injured by the breaking of the glass point of tip of a vaginal douche inserted into the vagina. The broken fragments were allowed to remain in her and she left the hospital ignorant of this condition. She thereafter consulted the defendant who also attended her in the hospital because of her continued suffering and he attributed her pain to the failure of the stitches to heal or to the non-absorption of the gut used for this purpose. The plaintiff secured a judgment against the defendant. The defendant appealed and the Appellate Court reversed the judgment and remanded the case for new trial.

The opinion of the reviewing court in this case set forth in detail the grounds for its decision. The court said: "It would hardly be profitable to enter into a discussion of the facts in this case in this opinion. The plaintiff has completely recovered. The only negligence claimed against the defendant is for his delay in making such an examination of the vaginal cavity as would disclose the

foreign substance thereafter found. Two experts of standing have sworn in behalf of the defendant that it would have been poor surgery to have made such an examination as would have disclosed the existence of foreign substance before the time it was actually made by the defendant. One expert on behalf of the plaintiff has sworn that such an examination ought to have been made three months before the plaintiff made it. It is always easy after the cause of an injury has been found to look back and say that that cause should have been sought for. To our mind the jury failed to give proper force to the fact that this defendant had never had the slightest cause for suspicion that any foreign substance could be causing this trouble. Every fact surrounding the case and its statement would constitute almost proof of its absence. The breaking of the glass of a vaginal douche within the vagina is a circumstance so rare as not to have been reasonably contemplated at any time by the defendant and for failure to anticipate this most unusual occurrence the defendant has been most unjustly charged with a substantial wrong judgment and what is worse, with a professional infidelity. That this error is clearly gained the weight of evidence is hardly to be doubted.

By the ruling of the court just quoted together with the facts of the evidence therein contained it can easily be seen that although the case was remanded for a new trial the plaintiff still had it well nigh impossible to introduce sufficient testimony to outweigh the above opinion. This is the first opinion in a small case which has been brought to the reviewer's attention where any mention is made of the professional standing or reputation of the defendant by a reviewing court.

J. A. C. STAC. 120

Malpractice Burden of Proof on Plaintiff *Med.* R. 901 4 09

The case of *Hier vs. Stiles*, 10 N. L. 25, is another case illustrating the general accepted rule as to the burden of proof in malpractice cases. This case arose from the alleged negligence of a physician and surgeon in the treatment of an injured finger. The court held that expert testimony as to what would be the ordinary usual and approved method of treating the injury under the same circumstances was properly admitted. In case of this kind the plaintiff must show that the defendant performed some act in his treatment which was out of accordance with the approved technique or that he omitted to do some particular thing which should have been done and further must show that such commission or omission resulted in the injury complained of.

J. A. C. STAC. 120

GYNECOLOGY

UTERUS

Alvarez, D. C. Value of Vaginal Hysterectomy in the Treatment of Uterine Cancer (Valor de la histerectomía vaginal en el tratamiento del cáncer uterino) *Arch de ginec obst y pediat* 1916 xxix 474.

In general Alvarez considers that radiotherapy is the best and most efficacious method known for treating uterine cancer. Its action however is preferably of higher value in cases that are diagnosed early. In his own practice the global statistics show 39 per cent of cures which appear definite and 37 per cent undoubted ameliorations in cases treated by radiotherapy.

Regarding extended abdominal hysterectomy as practiced by Wertheim and his school Alvarez thinks that these extensive interventions have a very high percentage of mortality even when practiced by the most capable surgeons. This mortality is much higher in the hands of gynecologists who lack the means of practicing high surgery. Definite recovery does not occur in more than 20 per cent of such operated patients. Simple abdominal hysterectomy while it has a lower mortality makes possible the danger of dissemination of cancer cells in the peritoneum.

Discussing vaginal hysterectomy Alvarez points out that as regards ganglionic involvement Schottlander and Kermanner only found it in 4 of 677 cases followed. Murphy asserted that in 50 per cent of uterine cancers including the most advanced extirpation of the ganglion was unnecessary and that the majority of ganglia cancerous before operation, were cured after hysterectomy.

The author's personal statistics of vaginal hysterectomy for proved cancer comprise 10 cases, of which 6 are known to be alive 7 have died within a year or so after intervention the condition of the remaining 6 is not known. Of the living 1 was operated upon 7 years ago 2 4 years, 1 3 years 1 5 years and the other for less than a year. There were approximately 20 per cent of more or less definite recoveries. Most of the patients were more than 55 years of age.

The author thinks that vaginal hysterectomy in the treatment of cancer is within the scope of the most modest gynecologist. It is strictly limited to cases which are diagnosed early. The efficacy of this intervention is shown by the fact that 20 per cent of the operated cases have a definite or very prolonged recovery. The association of vaginal hysterectomy and roentgentherapy both within the scope of every gynecologist will give an in-

creasing number of recoveries in cases of uterine cancer which are diagnosed at the right time.

W. A. BRENNAN

Hogan E. P. Ligating the Internal Ilacs and the Percy Cautey as Adjuncts in the Treatment of Carcinoma of the Uterus. *Tr South Surg & Gynec Ass* White Sulphur Springs 1916 Dec.

In the author's early experience with complete radical abdominal hysterectomy for carcinoma in operable cases his results were most disappointing. Since using the Percy cautery and ligating the internal ilacs and draining all cases of carcinoma of the uterus when doing the complete radical abdominal hysterectomy he has not had a death. Five radical abdominal hysterectomy cases are reported in the series. Other cases have been done by the same technique but they are omitted because they were early cases and the diagnosis was based on macroscopic and clinical evidence. They could not be classed as positive carcinoma cases.

In doing the complete radical abdominal hysterectomy for carcinoma of the uterus the author urges the ligation of the internal ilacs removal of all visible and palpable lymph glands, thorough sterilization of the vagina, and the use of the Percy cautery. The vaginal mucosa adjacent to the cervix should be severed by the cautery and the involved mucosa destroyed by the cautery.

Ten cases are reported EDWARD L. CORNWELL.

Dorland, W. A. N. Perithelioma and Endothelioma of the Uterus. *Surg Gynec & Obst* 1916 xxii, 576

Dorland records a case of perithelioma of the uterus and makes a statistical and analytical study of all the endothelial tumors of the uterus recorded in surgical literature. He emphasizes the anatomical and histological differences between the two groups of endothelial tumor the peritheliomata and the endotheliomata. The latter spring from the endothelium of blood vessels lymphatics and lymph-spaces while peritheliomata arise only from the perithelium or outer lining of the adventitia of blood vessels outside of which is the perivascular lymph-space. An endothelial tumor arising from the blood vessels is a very rare growth, much more so than that arising from the lymph-channels. The important point to note morphologically in a perithelioma is the persistence of the central lumen of the blood vessel, while the tumor-cells are arranged radially and axially from the adventitia of the vessel wall. On the other hand, the central space of the lymph or blood vessel the seat of an endothelioma

will be found to be choked with a mass of cells. These tumors form a distinct entity oncologically although they are closely allied to if not constituting a true variety of sarcomata.

A clinical study of endothelial tumor affords some interesting facts. At the most not more than 300 endothelial tumors of all kinds occurring in the human body have been recorded. The commonest sites appear to be the skin, testes, throat, the parotid and submaxillary glands, the neighborhood of the mouth and cheeks, the long bones, and the carotid gland. Other regions in which authentic cases have been noted are the eyelid, the optic nerve, the soft palate, the pelvic connective tissue, the brain, the subcutaneous connective tissue, the muscles, the kidney, the mamma, and certain serous membranes, as the pleura. Wherever occurring these tumors show a marked tendency to undergo hyaline degeneration. Endothelial tumors are slightly more common in women than in men. Age exerts a decided influence upon the growth. 73.87 per cent of the cases occur after the age of 40. The disease appears particularly in the fourth, fifth and sixth decades of life that is between 30 and 60 years of age. About one third of all the recorded cases have occurred in the female generative organs. Up to date but 50 cases of endothelial tumor have been recorded as occurring in the uterus. Of these, the average age was 46 years. Perithelioma of the uterus seems to develop a little later than endothelioma, the cases averaging 48 1/2 years, while the average age of the endotheliomata was 43 7/8 years. Sixteen of the women were 50 years old or more. As two-thirds of the women with uterine sarcoma are below the average in childbearing have not reached puberty, or have not borne children for a long time, a striking clinical difference will here be noted between uterine sarcomata and endothelial tumor.

Bleeding at times amounting to flooding is a very persistent symptom. Generally the clinical manifestations are those of malignancy — bleeding, foul purulent discharge and pain — or those of fibroid tumor — bleeding with a decided tumor mass or uterine enlargement. The cases give a death-rate of 30.79 per cent including the primary mortality — 17 per cent — and death from subsequent complications and recurrence of the malignancy. Most of the peritheliomata originate in the body of the uterus while half of the endotheliomata spring from the cervix. These endothelial tumors of both groups are frequently associated with develop in the tissues of fibromyomata of the uterus.

Ribas Ribas, L. The Menopause and Uterine Fibromat (Menopausa y fibromas del tero)
Arch. d. ginec. obst. y pediat. 96 vol. 4 8

Sarcomatous transformation of uterine fibromata is rare 3 to 5 per cent but carcinomatous transformation is frequent. Hertel's statistics of 468 cases show 20 malignant transformations of which 15 were carcinoma. If it is taken into account that

this malignant transformation usually occurs during and after the menopause it is easy to arrive at the conclusion that the menopause, far from being a period of salvation in the sense of curing uterine fibroma, favors their development by the vascular nutritional and toxic disturbances which occur at this time and which are forcible agents in the development of structural alterations of the fibroma moreover malignant degeneration is favored by the age of the patient who is then in a state of degeneration.

A physician cannot therefore hold out any hope to a patient with a uterine fibroma that the menopause will ameliorate her condition, amelioration will either be retarded, and such retardation may signify profound alterations in the nature of the neoplasm itself.

Ribas Ribas presents short histories of 34 cases of uterine fibroma operated upon between the ages of 45 and 65 which clearly indicate the influence which the menopause exercises on the fibroma, and which illustrate the opinion above expressed. In these 34 cases there were 4 sarcomatous transformations, 4 coexisting cases of cancer and fibroma, glycosuria, albuminuria, nervous troubles, etc. were often complications, due to the period, which hindered surgical intervention. There were 6 deaths in these 34 cases, while in 48 other cases of fibroma without such complications and at an age distant from the menopause there were only 4 deaths. The author therefore concludes that the menopause is more detrimental than favorable for uterine fibroma.

While in general the opinion that the menopause will cure fibroma is erroneous, yet it cannot be denied that in certain cases it may exert a favorable influence. It will be a clinical matter to decide when to abstain or intervene. A fibroma patient approaching the menopause who does not show marked genital alteration phenomena may hope but in the presence of alterations attributable to the menopause, if such are marked by hemorrhages or increase of volume of the tumor or painful exacerbations, or anemia, or toxic phenomena, such indications exclude any hope of betterment from the menopause.

W. A. BEECHER

Sheehy J. J. Removal of an Interstitial Fibromyoma. *N. Y. M. J.* 96 p. 53

The author reports a unique case of excision of an intramural fibromyoma situated in the lower uterine segment, at full term immediately after manual delivery of the placenta on account of hemorrhage. The excision was accomplished by the hand in the uterus.

D. H. BORN

Allen, J. M. An Operation for Retro- and Downward Displacements of the Uterus. *Surg. Gynec. & Obst.* 96, xliii, 68

The essential procedure in this operation consists in utilizing strips of the rectus sheaths cut from the edges of the usual midline incision, the upper end free the lower left attached for hammock

support of the uterus. An incision is made in the posterior surface of the uterus joining two points just below the uterine ends of the round ligaments, on either side. A right angle jawed hemostat is then thrust through the following structures from behind forward in the order named: the broad ligament just below the uterine end of the round ligament; the parietal peritoneum and posterior rectus sheath; and the fibers of the rectus muscle, appearing at the cut edge of the rectus sheath. The free end of the strip on that side is grasped and drawn backward and the same procedure is followed on the other side. The strips are then cut to proper length and sutured end-to-end in the bottom of the groove made in the posterior surface of the uterus. The incision in the uterus is then closed and one or two stitches are taken, attaching the strip to the round ligament and the broad ligament at their point of contact, and the abdomen closed.

The advantages of the method are that non-yielding tissues are used and the support is thus more permanent. Further the uterus is made a link to hold the vaginal walls in place, and much better anatomic position is secured and maintained than in a large number of the operations devised for the relief of these conditions. It is obvious that this method can be used only in patients where sterilization has been secured or in those past the menopause.

Pilcher J D, Burman, G E. and DeZell W R.:
The Action of the So-called Female Remedies
on the Excised Uterus of the Guinea Pig
Arch Int Med 916 viii 557

By extensive experimentation the authors have endeavored to ascertain the specific physiological action upon the uterus, of a number of the drugs used in the so-called female remedies — proprietary and patent.

In a general way, their method consisted in testing the action of a given drug — fluid extract or infusion — in various dilutions ranging from 1:100 to 1:100,000 upon excised strips of uterine muscle. These strips of muscle were attached to a lever and submerged in a bath (50 ccm.) of Tyrod's solution at a temperature of 38° C. through which a constant current of oxygen was passed. The ordinary revolving drum was used to record the tracings.

A tabulated summary of the action of each drug tested on the rate and amplitude of the excursions and on the tone of the muscle strips, is appended.

The final conclusions from this study are summed up as follows:

The drugs employed with but one exception manifest their actions on the amplitude of the contractions rather than on the tone or the rate of contraction. The action is essentially the same on the pregnant and on the virgin uterus.

The following drugs lower the amplitude of the excursion as their primary action: *Aletris farinosa*, *Pulsatilla pratensis*, *Scrophularia nodosa* and *Schizomethia piscipula* are very active in the strengths used; *Valeriana officinalis* (the oil is very active) and

Cypripedium pubescens somewhat less active; *Dioscorea villosa*, *Scutellaria lateriflora* and *Senecio aureus* least of all.

Caulophyllum thalictroides puts the strips into tonic contraction or tetanus.

Chamaedrifum luteum, *Leonurus cardiaca*, *Passiflora incarnata*, *Mitchella repens*, *Viburnum opulus* and *Viburnum prunifolium*, *Acer spicatum*, *Cnicus benedictus*, *Carduus marianus* and *Castanea dentata* are inactive.

The following infusions only are active and they are less active than the corresponding alcoholic preparations: *Leonurus*, *Scrophularia*, *Schizomethia* and *Cypripedium*. HARVEY B. MATTHEWS.

Razetti L.: Hysterectomy (Las hysterectomias)

Gac méd de Caracas 1916 xlii 137

From a long experience and study of hysterectomy and fortified by the expressed opinion gathered by corresponding with his leading colleagues, Razetti comes to the following conclusions regarding the operation:

1. Hysterectomy is a perfectly regular operation, the operative procedure being established on the data based on the anatomy of the contents of the female pelvis.

2. The perfection reached in the operative technique of abdominal hysterectomy has given to this operation an indisputable superiority over vaginal hysterectomy.

3. Each of the known procedures for uterine extirpation by the abdominal route has its special indications; the surgeon should be equally familiar with all and should know when to apply them opportunely.

4. When the uterine neck is healthy and there is no reason to fear its ultimate degeneration, subtotal hysterectomy should be preferred.

5. In every abdominal hysterectomy except in cases of uterine cancer the uterus and adnexa should be attacked in the lower part; vessels should be ligated in their trajectory and the bottom of the pelvis covered with peritoneum.

6. In every septic case and always when there is reason to fear a pelvic infection, this cavity should be drained by the vagina, by the abdomen or by both at the same time.

7. The result of abdominal hysterectomy depends to a great extent upon the prior preparation of the patient, the rapidity of the intervention, and the postoperative care.

8. Vaginal hysterectomy has its precise indications and its unquestionable advantages; it would be a grave error to ignore it systematically.

9. In vaginal hysterectomy there is one fundamental maneuver which should never be neglected, i.e. hemisection — anterior or total.

10. In vaginal hysterectomy permanent clamps are preferred to preventive hemostasis and buried ligatures which should be reserved for hysterectomies, for genital prolapse and to prevent the ligatures from relaxing.

In genital prolapse the uterus should not be extirpated unless the prolapse is complete and irreducible or the uterus is diseased or the woman past the menopause. The operation is always terminated by an anterior colporrhaphy and a colporrhaphy with myorrhaphy of the anal levator.

12. In uterine cancer when the disease is limited to the neck or to the corpus total hysterectomy should always be done. If the disease is in the early stages and the tumor freely movable vaginal hysterectomy may be done. If the peritoneal tissues are beginning to be invaded total abdominal hysterectomy should be done with prior ligation of the ureters. If the disease is greatly advanced it is better to abstain from a radical operation.

3. As a general rule in very hysterectomy peritonitis the method and procedure should be selected which in each particular case offers the best guarantee of ease and simplicity of intervention with the least immediate danger to the patient and which promises the best and most favorable results for the future safety and comfort of the patient this being the desired end of every surgical intervention.

W. A. B.

Stacy, L. J. Results of Myomectomy. *St. P. I. M. J.* 96 xviii 344.

In the series of 323 cases in which myomectomy was done in the Mayo Clinic from 1907 to 1914, inclusive the average age of the patient was given as 37 plus years, the youngest 25 years and the oldest 59. Of these over 46 per cent were 30 years of age or under and 70 per cent were 40 years of age or under. Of the 5 married women 50 per cent had borne children. This percentage of pregnancies is much higher than that given by most writers. Of those who had borne children 8 per cent had had miscarriages also. Of the series, 5 per cent had had miscarriages only.

Up to the present time myomectomy seems to be the ideal treatment of myomata. While the X-ray and radium may later prove to be the treatment of choice, sufficient time has not yet elapsed to know their ultimate effect on the uterine and ovarian tissues and their function.

The operative mortality was 0.6 per cent. In 5 per cent of cases there was an elevation of temperature following operation, but no complications to prolong the convalescence beyond the usual time.

Of the series 203 cases were followed. Six had died—cause not stated. A late hysterectomy had been performed in 7 cases, 1.34 per cent of the patients heard from. A curettement had been done in three cases. The menopause had occurred during the interval since operation in 20 cases. Menstruation was reported as regular and normal in 85 per cent, profuse in 11.3 per cent, scant and irregular in 6.3 per cent. There had been 6 miscarriages, 3 occurring in one woman. Normal, full term pregnancy had occurred 18 times. One patient who had been married three years before the operation without having been pregnant had 3 full-

term pregnancies and one miscarriage following the operation. In 5 other cases of sterility before the myomectomy normal pregnancies occurred following operation. One patient who had had a previous miscarriage had a normal full term pregnancy after operation. There were 4 cases of pregnancy at the time of myomectomy and these continued to full term.

EDWARD L. COYNE.

ADNEXAL AND PERIUTERINE CONDITIONS

Radio M. V. Marsupialization as a Method of Treatment of Some Cystic Tumors (La marsupialización como medio de tratamiento de algunos tumores quísticos). *Prog. d. Madrid* 96 V 4.

The treatment of ovarian cysts by extirpation is so frequent, simple and efficacious, that as a rule no other method is considered. In some cases of cysts coming to the author's practice he thought it better to proceed by marsupialization. These cases were (1) suppurated ovarian cysts, (2) large ovarian cysts retroperitoneally developed, (3) certain bydatid cysts.

Compared with total extirpation the procedure by marsupialization and evacuation is relatively innocuous, especially when the cysts are large and embedded in connective tissue.

While in general the author is satisfied that extirpation will best meet the requirements in a great majority of cases yet he thinks that in cases such as he describes in which extirpation is a very serious procedure there is no doubt but that marsupialization will be less of risk and be quite efficacious in its results.

W. A. BARRY.

Davis, C. H. A Contribution to the Etiological Study of Ovaritis. *Surg. Gynec. & Obst.* 96, ii 560.

The author reviews briefly the cultural and experimental work of Rosenow and himself (Abstracted *Internat. Abstract of Surgery* 1916 xdlf 300) and gives a more elaborate discussion of this subject from the question of etiology backing up his claims by clinical observations recorded in the writings of both gynecologists and clinicians. A few case histories are given in abstract to show the more common symptoms and operative findings in patients whose ovaries showed relatively large numbers of the streptococcus viridans.

The uncommon history of pelvic trouble following anginal attacks during the menstrual period the occurrence of pelvic infection following immediately tonsillitis the discovery of chronic tubo-ovarian inflammation in a young woman with a congenital atresia of the cervix and uterus, with an imperforate vagina and the isolation of the streptococcus viridans from her left ovary together with the experimental production of ovaritis in animals seems conclusive proof that hematogenous infection of the ovary occurs and that it may be responsible for much of the chronic ovaritis in which there is

not a definite history of gonorrhoea or poeperal sepsis.

A study of the tissues together with a careful review of the histories gives no new or definite means of choosing between a conservative or radical operative procedure. Since some ovaries are sterile and many contain only a few organisms the author believes that this study favors conservation of the ovaries whenever the operative findings will permit. In this series it was usual to find rather large ommers of streptococci in the ovaries of the patients who came to second operation. It is better for a young woman to submit to the second operation than lose both ovaries the first time even if there is an equal chance that the conserved ovarian tissue may degenerate.

Novak, E.: *The Corpus Luteum; Its Life Cycle and Its Role in Menstrual Disorders*. *J Am M Ass* 916 kvii, 1285

With a few exceptions those who have studied the corpus luteum in the past have seemed to disregard the fact that, like the endometrium it undergoes a change from day to day. The stereotyped conception of the corpus luteum seems to have been that of a large structure, with brilliant yellow undulating walls standing out sharply from the cut surface of the ovary. While this description fits the corpus luteum in certain stages of its development it is altogether incorrect as applied to others. The above mentioned characteristics are apt to be those of the fully developed corpus luteum which has however reached this stage only after a process of gradual development extending over many days. The presence of the large yellow walled corpus luteum does not, therefore, signify that ovulation has occurred just previously as so many have assumed in discussing the subject.

In its earliest stages just after rupture of the graafian follicle, the corpus luteum is usually a small, collapsed structure, with thin, moderately undulating walls which are of a grayish yellow hue instead of the brilliant yellow color of the later stages. For this reason the earliest stages are very inconspicuous and are usually overlooked. Indeed, their discovery even with careful search must be looked on as accidental in a large measure. The difficulty of securing corpora lutea in these early stages is increased by the uncertainty as to the exact time of ovulation so that it is not possible in the present stage of our knowledge to arrange operations of election with a view of obtaining these early corpora lutea. Again there is much evidence that the changes in the early history of the corpus luteum take place very rapidly so that the earliest stages speaking histologically extend over a comparatively short time.

Five specimens of early corpus luteum are reported which are alike in the very important particular that in all of them the epithelial cells of the granulosa are quite intact. This fact is of prime importance in the consideration of the origin

of the lutein cells. One of the strongest arguments against the epithelial origin of these cells has been the alleged degeneration and disappearance of the membrana granulosa after rupture of the follicle. In each of the five specimens however, the epithelium is well preserved. This is the vital point in connection with the question of the origin of the lutein cell.

As to the time relation of these early corpora lutea to the menstrual cycle only two of the five cases unfortunately can give any trustworthy evidence owing to the irregular bleeding present in the others. It would be indiscreet to draw from this small group of cases any conclusions as to the time of follicular rupture. The author simply states that in the five cases reported ovulation seems definitely to have occurred in the first half or perhaps the second quarter of the intermenstrual period and that the time of follicular rupture is subject to a certain — perhaps a considerable — degree of individual variation.

The later stages of the development of the corpus luteum he passes over much more briefly as his observations differ in no important respect from those of Meyer. The most significant feature of this stage however is the invasion of the lutein layer by small blood channels. These are clearly traceable back to the ring of blood vessels which marks the division between the granulosa and the theca. Some of the blood in the lutein zone is present in definite endothelium lined vessels while some lies free between the cells making its way to and into the cavity of the corpus. Even in this early stage, endothelial cells may be observed here and there to push out into the lumen forecasting the organization of the blood contents which takes place in the late stages of the corpus luteum. It will also be seen that vascularization of the lutein layer is chiefly responsible for the bleeding into the cavity of the corpus and for the organization of the lumen contents. From a physiologic point of view it is of great importance because in addition to carrying nutriment to the lutein cells, it enables their secretion to be emptied directly into the blood stream. Together with the advance in the development of the lutein cells, there is a corresponding retrogression in the theca cells. They have lost most of their fat and are apparently reverting to the type of ordinary connective tissue cells.

An exceedingly interesting feature of many corpora lutea, especially near the stage of maturity is the remarkable development of the theca interna cells. The theca cells are fully as well-developed as are the lutein cells though of quite a different type. The contrast is very striking. The large size of the theca cells their alveolar arrangement the richness of their blood supply all suggest a glandular structure and function. The author does not believe as does Meyer that the theca cells after fulfilling a nutritive function in the earliest stages of the corpus luteum retrogress and serve no further purpose.

There can be little doubt that the corpus luteum possesses at least a dual function. Since the lutein cells proper are almost certainly concerned in the causation of the menstrual phenomena, perhaps the paralutein cells are in some way concerned in the other important function ascribed to the corpus luteum. This, however, is a problem of biologic chemistry. Within the authors' observation of nineteen corpora lutea exhibiting marked development of paralutein cells, all but a few were removed from patients who gave histories of profuse and in a few instances, irregular menstruation. It is curious to note, also, that many of the patients were sterile. In some cases pregnancy had never occurred although the patient had been married many years, while in others there had been a long period of secondary sterility.

LOWAN L. COE, M.D.

EXTERNAL GENITALIA

Hess, A. P. Provocative and Prophylactic Vaccination in the Vaginitis of Infants. *Am J Dis Child* 9 6 xii 466

Postmortem examinations show that in the subacute and chronic cases of vaginitis in infants the cervix is most frequently involved and that the vagina generally shows no signs of inflammation. Cervicitis would therefore seem to be a more correct term, in this connection, than vaginitis.

Where numerous pus-cells without bacteria are found in smears made from the cervix, an inflammation may be assumed to be present and in the overwhelming majority of instances the etiological factor will be found to be the gonococcus. Other micro-organisms may however be the cause of the inflammatory process, for example a streptococcus, as in a case which was studied both during life and after death. It should be borne in mind that smears taken from newborn infants very frequently show pus-cells, probably due to the invasion of the vagina by saprophytic bacteria, and that in the newborn they should not be considered pathologic or as evidence of gonococcal inflammation.

Gonorrheal vaginitis or cervicitis, should not be regarded as a disease encountered especially in institutions, as it may be found in a considerable proportion of infants living in the crowded tenements in the city.

In child-caring institutions the greatest obstacle to limiting and controlling the spread of this disease is the difficulty of recognizing latent cases. It affords, therefore, but one more aspect of the problem of the healthy but dangerous carriers and of the difficulty of devising methods to prevent

contact infection. By means of provocative inoculations of gonococcus vaccine it has been found possible to ascertain the concealed carrier into an open case and in this way to discover many cases which had eluded detection. Vaccinations have also some prophylactic value and may either confer protection or render subsequent infection mild in character so that it assumes a bacteriologic rather than a clinical type.

There is not only a natural susceptibility to this infection and an acquired susceptibility as occurs in the course of scarlet fever, but a natural immunity which may be sufficient to protect infants who come in contact with infected patients.

EDWARD L. C. ELLI

MISCELLANEOUS

Steg 1. The First 1000 Gynecological and Obstetrical Operations Under Regional Anesthesia (Bericht ueber die erst Tausend gynakologischer und geburtshilflicher Operationen in Leitungsanesthetose). *Deutsche med. Wochenschr.* 9 6 xii, 79.

Comparing the lumbar and paravertebral regional anesthesia (nerve blocking) ideal anesthesia was obtained in 56 per cent lumbar, 47 per cent sacral and paravertebral in 90.7 per cent. Where supplementary narcosis was necessary on an average 3 g chloroform and 3 g ether were required for lumbar anesthesia, 9 g chloroform and 8.6 g ether in sacral and 9 g chloroform and 9.6 g ether in paravertebral anesthesia.

The superiority of the paravertebral anesthesia is therefore apparent. The 1000 cases operated upon by Steg 1 included 40 abdominal operations, (30 being abdominal operations), 17 nephrectomies, 240 gynecological operations, and 52 obstetrical operations—2 Porro cesarean sections. With 90.7 per cent of favorable results and with total operative duration of over 800 hours, only a small amount of supplemental inhalation narcosis was necessary which shows the value of paravertebral anesthesia. Blurred except for temporary pallor and a temporary pulse increase no other untoward symptoms appeared in 802 cases. In only 7 per cent was there slight perspiration, in 3.8 per cent there was temporary inclination to vomit and in 6 per cent actual vomiting occurred. Neither death nor disturbance of respiration was observed. The after symptoms were very slight and temporary.

No contraindications to paravertebral anesthesia have so far been observed. It has the disadvantage that each nerve has to be anesthetized separately.

W. A. BRENNER

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Raimat M F: Ectopic Pregnancy Consisting with Uterine Pregnancy (Embarazo ectopico co-existiendo con embarazo uterino) *Arch de ginec obst y pediat* 1916 xxix 450

Cases of simultaneous tubal and uterine pregnancy are extremely rare. The statistics of Neugebauer taken from the world's literature and published in 1913 showed 243 cases in all, 107 of which were published in the 18th and 19th centuries and the remaining cases from 1901 to 1913. Welbel in 140 ectopic pregnancies cites 1 case with uterine pregnancy. Neugebauer 2 in 131 such cases.

The author reports a personal case in a woman of 25. The history showed two previous abortions. The author saw her about fifteen days after a third abortion when there was abundant and continuous metrorrhagia. The uterus was large and petulous and nothing suspicious was noticed in the adnexal region on examination. Curettage was practiced and a sufficient amount of placental and membranous remnants extracted to leave no doubt of the prior pregnancy. Some days later there were sharp pains in the left adnexal region. These persisted until the patient left the clinic; there was an evident tumefaction in the region which suggested either a small cyst or the possibility of an ectopic pregnancy. Some days later the author received an urgent call and the symptoms left no doubt that it was a case of tubal abortion.

On laparotomy after removal of extensive intestinal adhesences a large hematosalpinx was disclosed on the left side which circumscribed the whole posterior face of the uterus completely covered the fundus, and was strongly adherent to the opposite tube. Raimat executed a subtotal hysterectomy. The postoperative course was normal. The hematosalpinx contained evident embryonic remains resembling a two months fetus. The author is satisfied that in this case both ova were fecundated at the same time. W. A. BRENNAN

Lothorp E. P.: Extra uterine Gestation. *N Y M J* 1916 clv 735

The author reviews the symptomatology of this condition with illustrations taken from a group of 83 cases which were carefully studied. The records show no pathognomonic signs of unruptured extra uterine pregnancy. It is often suspected but confused with gonorrhoeal salpingitis, hematosalpinx, and retroverted gravid uterus with prolapsed ovary.

It is suggested that diagnosis at the time of rupture seems to depend upon the severity of the symptoms, rather than the grouping of symptoms

64 of these cases being discovered between 14 and 365 days after the rupture. That collapse, which occurred only in 10 cases, is not always in proportion to the amount of blood lost as shown by Waldo that many cases complained of upper abdominal pains which were mistaken for disturbances of digestion that case in the taking of histories would have shown in most cases, at the time of rupture suggestive symptoms of this condition that most of these cases had had several attacks of pain before being seen by the surgeon.

After rupture, the history of supposed pregnancy, pain shock, flowing development of tumor and exsanguination make the diagnosis relatively easy. In spite of this records show a surprising number of such cases having delayed operation and the author urges more careful history taking and ever-present suspicion of this condition.

The operative findings and complications are reviewed and surgical treatment discussed.

Barrionuevo I M.: A Case of Tubal Extra uterine Pregnancy at Full Term Without Rupture of the Tube (Un case de lesion de termino en el tubo de falopía sin ruptura) *Anal d hosp de San José Costa Rica*, 916 15

The author reports a case illustrating the rare occurrence of a tubal pregnancy proceeding to term without rupture of the tube. The patient was 36 years old, a V para, two of the children having been born dead. She had always had hemorrhages in the first months of pregnancy. There was no history of venereal infection.

In the early part of 1914 the patient consulted a physician for pains in the lower abdomen. She was told that she was then four months pregnant. The pains disappeared soon after but about six months later they again recurred in the form of labor pains accompanied by scanty hemorrhage per vaginam but with some substantial matter also ejected. The abdominal extension continued but the fetal movements previously noted ceased.

Examined by the author some months later the woman showed an abdominal tumor very marked between the pubis and the umbilicus. It occupied the umbilical hypogastric, left lumbar and iliac regions. It was not movable and no fetal movements could be felt. It was thought to be a dermoid cyst of the left ovary with a possibility of its being a lithopedion.

Laparotomy showed the tumor strongly adherent to the intestines and omentum. In the separation of these the sac was unintentionally opened in the upper and right segment and the hand of a fetus issued. The fetus and placenta were extracted.

The sac was separated from its intestinal attachments. There was no liquor amnii and no inflammation nor decomposition within the sac. Some difficulty was experienced in separating the placenta. The ovary on the right side was intact but there was neither tube nor ovary on the left side. It was therefore apparent that the sac was the left tube which had developed sufficiently to contain a full term fetus and retained for four months longer without rupture.

As the uterus had not been opened and the right appendages were healthy hysterectomy was not done by the author. The uterus was of normal non-pregnant size. The abdominal cavity was closed and drained and the patient left the hospital seventeen days later after a perfect recovery.

Pathological examination of the fetus showed it to be 35 cm. long the fontanelles having a tendency to ossification. W. A. BRECKENRIDGE

Kronitz. Cesarean Section in Placenta Prævia (Ueber Kaiserschchnitt bei Placenta prævia) *Deutsche med. Wochenschr.* 9 6 xlii 78

On the accepted clinical principle that not only the mother but also the child must be saved, version and metrorrhysis cannot be considered satisfactory procedures in placenta prævia. Both are unsatisfactory for the mother on account of the hemorrhage and infection, and both give bad results for the child.

The implantation of the ovum in the isthmian wall in placenta prævia is generally accepted today. There is, therefore, a strong infiltration of the isthmian wall with fetal cells, sometimes causing rupture. The stretched condition of the isthmian wall renders operations such as vaginal cesarean section version or metrorrhysis undecidable. Section of the corpus uteri eliminates the dangerous isthmian zone in the extraction of the child and is therefore more suitable than any other obstetrical method.

Clinical observations justify this course and, moreover, few obstetrical methods save so much blood in placenta prævia isthmica. The number of observations is at present so great that this can be stated with certainty. Hemorrhage in version procedures and metrorrhysis become dangerous only after extraction of the child. It results in almost all cases from the eroded isthmian vessels and in sufficient contraction of the isthmian wall. Although vaginal cesarean section reduces the tension of the isthmian wall, there is danger that the thinned wall may tear in suturing leading to fatal hemorrhage and such results have been several times reported.

The danger of hemorrhage due to rupture of the isthmian wall is especially great in vaginal cesarean sections in primipara. In all cases of placenta prævia isthmica section of the corpus uteri gives the best results for the child. But corpus uteri section has the disadvantage that in infected birth canals the danger of peritonitis following is increased.

Therefore as a prior condition to this section an aseptic canal is necessary. The danger arises from the hemorrhages occurring in the last months of pregnancy and improper tamponade. It is, therefore, most desirable that cases of placenta prævia be sent to the hospital on the first showings, in as much as cases privately treated show a maternal and fetal mortality of 30 and 70 per cent, respectively.

When a patient with placenta prævia isthmica comes to the clinic febrile and tamponed on account of severe hemorrhages, it is a matter of doubt whether it is best to execute a cervical, transperitoneal, or extraperitoneal cesarean section. A corpus section is contra-indicated if the os is already large than a 5 mark piece as the danger due to the expanded isthmian wall cannot be obviated by cesarean section, and other methods must be considered. W. A. BRECKENRIDGE

Saint Goehlinger and Potré. A Cesarean Section Caused by a Shell Burst (A propos d'une césarienne par éclat d'obus) *Progrès Méd.*, 9 6 p. 196.

The authors relate the case of a woman of 35 6 months pregnant who was seated at a window in one of the frontier towns under bombardment. A shell burst in the street below and a fragment struck the woman in the lower abdomen. Examination of the hospital showed the projectile of 600 entry below and to the left of the umbilicus and its outlet in the vicinity of the left crural arcade. The eploeon showed at both orifices. The uterus was in anteversion but the position of the fetus could not be made out and auscultation was negative.

The abdominal muscles on palpation appeared to be completely sectioned. Intervention was decided on and classical incision for a subumbilical laparotomy made. A wound about 5 cm. long was seen in the uterine fundus extending from the median line downward and to the left. Through the wound the lumbar region of a fetus could be seen with a small shell wound in this region. A median incision of the uterus was made and the fetus and placenta removed. Believing that the fetus was dead the authors paid little attention to it, but while proceeding with the operation on the mother the cries of the child showed that it still lived. It survived for fifteen hours after the traumatism. The superficial wound on the child was about 5 cm. long.

The postoperative course of the woman was normal and she left the hospital completely recovered. The authors think that the presence of the fetus in this case saved the mother's life as it prevented the probable perforation of the intestine. W. A. BRECKENRIDGE

Beer L. The Leucocytes in Pregnancy Labor and the Puerperium. *Surg. Gynec. & Obst.*, 19 6 xlii, 567.

To establish a standard of comparison for the leucocytosis and differential analysis of pregnancy

labor and the puerperium as an aid in determining whether the count in a given case is physiological or pathological the author analyzed 25 cases in late pregnancy and 87 cases in labor and the puerperium in the words of the Michael Reese Maternity making daily counts and differentials for ten days postpartum.

The literature contained no series large enough to establish a standard scale, and the discrepancies between various investigators together with the varying conditions under which their results were attained made it seem impracticable to the author to combine their figures even from only the more recent sources.

The following summary is given:

1. There is a leucocytosis of pregnancy appearing in the ninth month, slight in amount and especially noticeable in primiparae.

2. The leucocytosis of labor is marked in primiparae averaging 18,255 and is increased by a duration of labor beyond twenty-four hours. It is less marked in II paræ and is slight in III-plus-paræ.

3. The height of the curve in primiparae and multiparae is reached on the first day of the puerperium after which there is a rapid and constant decline to the tenth day at which time the curve is about at the normal level.

4. The onset of lactation does not influence the leucocyte count except that in the fourth day primiparae there is a slight secondary elevation on the preceding day about 1,500 to 2,000.

5. Age is not a factor except in primiparae aged twenty years and under in whom the leucocytosis is higher than in any other group.

6. Differential analysis showed the increase in leucocytes to be chiefly in the polymorphonuclear neutrophils with a return to normal proportions by the third day of the puerperium in an absence of eosinophiles in about half the cases in labor and their reappearance in normal proportions on the first day of the puerperium.

7. The lymphocytes large and small mast cells and transitional types, showed nothing unusual.

8. The Arnet's analysis showed a displacement toward the left i.e. toward Classes 2 and 3 but this was not constant and no pertinent deductions could be drawn.

Hellman A M: Obstetrical Abdominal Hysterotomy with a Report of Twelve Cases. *N J M J* 1916 clv 74

The author has performed cesarean section in 12 cases: 4 for disproportion between head and pelvis; 1 for transverse position; 3 for placenta prævia; 1 or near term; 1 for congenital occlusion of the vagina with slightly contracted pelvis; 2 for eclampsia at term; and 1 for eclampsia at six and a half months.

Both the eclamptic patients died with convulsions otherwise the results were good.

The technique is given in detail and includes a high incision with an incision in the fundus of the uterus from tube to tube.

The following are considered indications for cesarean section:

1. Relative disproportion between fœtus and pelvis (a) contracted or deformed pelvis (b) monster or overgrowth of fœtus—dead or alive.

2. Tumors obstructing labor (a) of the bony pelvis as in exostosis (b) of the uterus as fibroids or cancer (c) of the ovary as cyst or tumor (d) of the sigmoid or rectum (e) displaced kidney acting as a tumor.

3. Placenta prævia, especially if central at term. Under this heading may be included accidental hæmorrhage.

4. Eclampsia, to empty the uterus rapidly with out much shock.

5. Certain malpositions as impacted face or cross presentations. The latter is frequent after vorticosuspension.

6. Deformities of uterus and vagina (a) atresia vagina (b) double uterus.

7. Severe cardiac conditions to which sterilization is usually added.

8. Instead of high forceps on the floating head in non infected cases.

9. Once a cesarean always a cesarean.

10. Gunshot wound through gravid uterus (suggested by Zicke).

11. Moribund or dead mother with living child.

12. Tonic contractions of uterus and dry labor (suggested by Davis).

13. Prolapse of cord with undilated cervix (suggested by Davis). D H. Born

LABOR AND ITS COMPLICATIONS

Polak J O and Phelan G W: Management of Labor in Borderline Contractions of the Pelvis. *Am J Surg* 1916 xxx 359

The authors emphasize the following points in the management of cases with borderline contractions of the pelvis:

1. Accurate pelvimetry is absolutely necessary in order to recognize the type of deformity.

2. Pelvimetry without the relative estimation of the size of the fœtus is of little value and the most accurate fetometry is the test of labor.

3. Every borderline case should be given a test of labor and this should be conducted in a hospital under the most scrupulous asepsis. All examinations should be made through the rectum. Only in making the ultimate decision as to procedure is a vaginal examination to be made. This is then done with the patient anesthetized and under the strictest surgical technique.

4. Spontaneous delivery will reward patience and vigilance in 80 per cent of such cases.

5. Pubiotomy is safe in multiparae with flat pelvis of 5 cm. or over in just minor contraction when the conjugate vera is over 8.5 cm. and in funnel pelvis in primiparae. The Doederlein technique is the simplest and safest.

6. Extrapartient section should be selected

as the method of delivery when the labor has been prolonged and the membranes have been ruptured for a long time. The classical operation should be reserved for the elective cases, and no hard and fixed rule can be set down for the management of any case. D. H. BOYD

Carter, R. M.: Spontaneous Evolution in Transverse Presentations. *Surg Gy & Obst* 96 xiii, 630

A case of spontaneous evolution in a transverse presentation is reported.

These cases are very rare and a favorable outcome by spontaneous evolution is the exception.

Several terminations are possible if left to Nature.

1. Spontaneous rectification may occur.
2. Spontaneous version may be brought about during the first stage of labor.
3. Spontaneous evolution may take place.
4. Death of the patient may occur from rupture of the uterus.

5. The palms may cease, the foetus become infected, giving rise to a physometra, with general sepsis and death of the patient.

The various mechanisms of spontaneous evolution and the conditions necessary for its occurrence are described.

Treatment of neglected transverse presentations consists in version if possible otherwise decapitation, or in very favorable circumstances cesarean section.

Arteaga, I. F.: Clinical Note of an Umbilical Trunk Presentation (Presentacion de tronco nidad umbilical—nota clinica). *Rev d med y cir* Habana, 96 xxi, 419

Arteaga reports a dystocia in a multipara of 33 in whom the os was dilated but descent was blocked. Examination by palpation and auscultation suggested the diagnosis of an incomplete presentation of the buttocks. After artificial rupture of the bag of waters the fingers immediately touched the cord which protruded. The cord was followed by exploration to its umbilical insertion and the lower extremities sought but they could not be found in the flexed position. It was thought that the foetus might be a monster; however a foot was soon seized which proved to be the right and shortly after the other was found. Podalic version was done and a fine perfectly formed child extracted.

The further course was normal. None of the usual causes, hydramnios, uterine tumor malformation of uterus, etc. were present in this case. Podalic version seemed best because cephalic version would have been difficult and probably would have called for forceps.

W. A. BREXMAN

Mosher, G. C.: Present Day Indications for Obstetrical Forceps. *Am J Surg* 96 xxx, 368.

The author believes the use of forceps is to be considered whenever a condition threatens the life

of mother, child or both and the instrument can be used to terminate labor without great danger to either. The head of the foetus must present occiput anterior or be able to be rotated anterior; the head must be engaged two-fifths of an inch at the brim; the cervix fully dilated and the blades must be fitted to the sides of the child's head. Prolapsed cord is to be considered instead of forceps only in a multipara with the head in the pelvic cavity left occipito-anterior position with inertia and stasis at the outlet.

In regard to the choice between forceps and cesarean section, cesarean is indicated in any instance where with failure of maternal efforts there is no euglycemia; if there appears to be danger to the mother—rapid exhaustion, hemorrhage, signs of rupture of the uterus, eclampsia—or to the child—a pulse of over 150 or under 120 or a discharge of meconium in a head presentation or rapid convulsive fetal movements. D. H. BOYD

Jimenez, N.: A Case of Dystocia Due to Flat Pelvis (U caso d distocia por pelvis plana). *Rev d med y cir* Medellin 96 li, 77

Jimenez reports a case of dystocia in a woman of 23 years. In her first labor about a year before there was also a dystocia—right vertex presentation. After podalic version it was absolutely impossible to bring the head down by the maneuver of Champetier. Ribs and the labor was terminated by episthiotomy.

The patient came to the clinic again in the eighth month of her second pregnancy. Examination showed no evidence of deformity nor rachidism, but a very careful search showed a very pronounced lumbar inlet; the pubis was in anteversion and the rhombus of Michaelis frankly deformed. The patient was kept in the hospital under observation until the completion of the term. Labor commenced at term. About ten hours after the onset of labor the os being fully dilated the head was mobile in the left transverse position, not freely overlapping the symphysis pubis. Four hours later the forceps were applied and the foetus extracted. It was asphyctic but revived under treatment.

The dystocia in this case was due to the non-rachitic flat pelvis which had a minimum promontory-pubian diameter of 8.5 to 9 cm. W. A. BREXMAN

D'Arcy, C.: Dystocia Due to Ventrosuspension of the Uterus. *Med J Austral* 96 B, 74.

D'Arcy reports three cases of dystocia due to ventrosuspension of the uterus. In the first case labor was twenty days overdue; the woman was 3 days in labor with the child in a transverse position; cervix with no effacement after three days of labor. Cesarean section disclosed the uterus bound to the anterior abdominal wall by a fibrous band which was attached to the posterior part of the fundus.

The second case was a premature labor at seven months following a ventrosuspension done twelve months previously. Upon evidence of internal

hemorrhage cesarean section was done. A premature detachment of the placenta was found. The placenta was extensively thrombosed.

The third case was that of a young woman who had had a ventrosuspension done three months previously. After three days labor a cesarean section was done. A loop of the bowel was adherent to the uterus at the site of the uterine sutures.

The author concludes that the operation is a bad one from the standpoint of obstetrics.

W. F. HEWITT

Rushmore S. Treatment of Weak Labor Pains.
Boston M & S J 1916 clxxv 659

Rushmore points out several methods of treating weak labor pains. The hydrostatic bag is recommended unless delivery is indicated promptly on account of the condition of mother or child. Should rapid evacuation of the uterus become imperative the author prefers vaginal cesarean section in primiparae to manual dilatation. He also reviews numerous ecbolic drugs and describes in particular the use of pituitrin. He gives about 1 ccm. of the drug intramuscularly in suitable cases in which there is no pelvic disproportion and in which the os is dilated at least 2.5 inches. He states that adrenalin is probably the most powerful oxytocic known. It is contra-indicated during labor as it produces tetanus uteri. Although its effect is transitory 10 minims of a 1:1000 solution injected into the walls of the uterus, the cervix having been drawn down for that purpose promptly checks postpartum hemorrhage.

F. C. IANVRO

Allen H. C. The Recent Experimentations with Nitrous-Oxide and Oxygen in Obstetrics.
J Am Inst Homeop 1916 ix 527

The conclusions are the result of the author's first hundred cases.

In this series of cases 66 were primiparae and 34 multiparae. Of this number 8 were excited by the gases and there was some difficulty in managing them, but usually when patients are excited by nitrous oxide quiet may be gained and maintained by increasing the percentage of oxygen. The average percentage of nitrous oxide in this series was 60 per cent and 33.1 per cent oxygen to maintain analgesia. Two cases took only 50-50, 4 required 60-40 and one 80-0. Eighteen cases required sutures there were no second degree tears, one forceps and three breech.

Barring the early cases there have been none who have not had all the benefits wished for with the exception of those who take nitrous oxide poorly. There have been no fatal results to either mother or babe no cyanosis of children and no cases of hemorrhage. In this series only selected cases were used.

EDWARD L. CORWELL

King R. W. : Perineal Anesthesia in Labor. *S. R. Gynec & Obst* 9 6 xliii, 65

Using one and two per cent solutions of novocaine with one-third minims of 1:1000 adrenalin to each

cubic centimeter the author has succeeded in securing painless or nearly painless childbirth in nearly one hundred cases.

Diagrammatic cuts illustrate the sensory innervation fascial planes and sites for the injection.

The author states that Colles' fascia is extremely sensitive and the stretching and tearing of the membrane is the cause of the great pain accompanying the birth of the presenting part.

In primiparae where Colles' fascia is intact 1.5 ccm. of the 2 per cent solution is injected into each superficial perineal interspace giving perfect anesthesia in the second stage of labor.

In multiparae in addition to the anterior injections it may be necessary to inject from 5 to 10 ccm. of the one per cent solution into the ischioanal fossa if Colles' fascia has been badly lacerated in former labors.

In the anterior triangle of the perineum after penetrating the integument a sudden expression of pain by the patient marks the depth of Colles' fascia, and passing the needle one centimeter further the injection is made.

In the ischioanal fossa the needle is entered midway between the tuberculi and anus and from 5 to 10 ccm. are injected the amount varying with the adiposity of the subject.

The author makes the following claims as to the results:

1. No adverse results have followed the injections.
2. Anesthesia lasted from two to four hours.
3. Lacerations and hemorrhage were greatly diminished.
4. Benzine and iodine sterilization of the obstetrical area can be rapidly and painlessly carried out following the injections.
5. The general practitioner can safely and easily apply the method at the bedside.

PURPERUM AND ITS COMPLICATIONS

Judd A. M. : Postpartum Sepsis. *A. J. M. J.* 9 6 clv 99

The author reports a study of 100 cases, 52 postpartum and 48 postabortive. Of the postpartum cases 34 were said to be spontaneous deliveries in as much as forceps were not used. Sixteen were forceps deliveries and two were versions. The cases are classified as (1) toxemias including the sapremias and all cases with distinctly local lesions without bacteremia, (2) septicemias subdivided into bacteremias and pyemias. There were 93 toxemias of varying degrees of severity, 6 bacteremias and 1 pyemia. There were 7 deaths, 5 postpartum and 2 postabortive. Of the 5 postpartum deaths 2 had negative blood-cultures, one dying of peritonitis and the other of lobular pneumonia. Of the three that had positive blood-cultures one had bacteremia and pyemia and the other bacteremia only. One postabortive case showed positive cultures. One case of strepto-

coccus bacteremia recovered. The average stay in the hospital was twenty five days.

Hospital treatment is advised in all possible cases. Examination is directed toward finding the focus of infection. Pelvic examination is considered in the light of an operation and conducted accordingly. Local lesions are carefully noted. Placental rests and membranes are removed with the gloved finger or placental forceps. Severe bleeding is stopped by vaginal pack. Douches and curette are advised against. The important part of the treatment consists in building up the patient's resistance by concentrated food and fresh air. If an abscess develops it is opened and drained. Vaccines are used only in cases of old pelvic exudates with pus which have been opened but continue to discharge. Daily cathartics are not necessary. The Gellhorn baker is recommended in brown cases with large exudates. Iron and tannic acid of value in old cases.

(C) H. M.

MISCELLANEOUS

DeLuca F. A. Biologic Diagnosis of Pregnancy
(Essays de diagnostic biologique del embarazo)
Sem. med. 1, viii, 30

In this preliminary report the author calls attention to a new biologic sign—the diagnosis of pregnancy in the hope that further trials will prove or disprove it.

The sign depends on a phenomenon which the author terms the rhinohemolytic reaction. There are two phases resulting from this phenomenon. The first phase or sign is that the urine of pregnancy has the property of coagulating the hemolytic action of the respect amoceptor. In series of test tubes containing amoceptor hemolysis will be effected in the order: (1) in tubes with the hemolytic system plus the urine of pregnancy; (2) from five to ten minutes later in tubes of the hemolytic system alone; (3) in tubes later in tubes of the hemolytic system which may urine (fetal or pregnant urine) has been added.

The second phase or sign is that the urine of pregnancy has a slow but real hemolytic action on red globules.

W. A. BRENNAN

Markos, J. W. Posture in Obstetrics. *J. Am. M. A.* 4
p. 614, 1906

The use of posture is of great assistance. In the weak pains the sitting posture will allow the weight of the uterus to tend to bear steadily on the cervical zone slowly dilating the part by the force exerted by the bag of waters whereas in the case in which the contractions are severe the patient may possibly recline to better advantage than by walking about or sitting. The bag of waters in moderate degrees of pelvic outlet action the chair will be of great assistance in allowing full dilatation to take place before the patient has become worn out by long-continued efforts and the consequent thin-

ning out of the lower half of the uterus with the not infrequent contraction of the ring of Bandl which, when carried too far will mean an impossible delivery by normal process. Even in the second stage in old primiparae the chair may be used to great advantage to dilate the rigid pelvic floor. Of course here the greatest care must be used not to carry it too far.

The rocking chair found in every home can be made into an excellent obstetric chair. The author's method of using the chair is as follows. When regular contractions have been established, the patient is instructed to conserve her strength by not remaining too long in one position but to sit from time to time in the chair with the knees elevated so that they support the enlarged abdomen and to have the chair so padded with pillow blankets that the maximum of comfort is afforded. In such a chair if her pains are weak, she may comfortably sleep for half an hour or more and the accoucheur will be satisfied by the fact that the weight of the uterine contents is being exerted on the cervix not in a harmful way but with a steady hydrostatic pressure that at this stage does more to shorten the labor than anything else. If she becomes restless in the chair or the contractions are weaker she may with benefit walk about the room or even recline. Again the inclination of the chair is of the greatest importance as in old multiparae with abdominal wall so relaxed that the uterus is completely relaxed in the upright position. A ladder should be placed and the chair so tipped back that the axis of the uterus will point directly downward into the pelvis.

The author illustrates two chairs used in hospital practice—one for normal cases and one for operative. Since he began to use the chair he has performed fewer operations such as cesarean section, versions, forceps, etc. and a study of his statistics shows an improvement there being a decrease in deaths of mothers, fewer stillbirths and fewer deaths of infants following labor. As late as perineal laceration he says it has not apparently affected them as far as can be seen in the few cases collected, and the author believes that where lacerations or other complications of similar nature do occur the fault lies with the accoucheur in not controlling the progress of the child through the parturient canal in time to prevent such accidents.

EDWARD L. CORWELL

Falla, F. H. Epidemics of Pemphigus Neonatorum in Chicago. *J. Am. M. A.* 11, 5, 614, 1906

Eight small epidemics of pemphigus neonatorum have occurred in Chicago within the last year. The disease is epidemic staphylococcal vesiculodermatitis occurring usually in newborn babies from the fourth to the fourteenth day, but capable of being transmitted to older children and adults. The exciting organism is peculiar strain of staphylococcus which is biologically a distinct variety indistinguishable from other strains (staphylococcus) but which shows characteristic pathogenic ten-

dencies when causing the specific disease on the human skin.

The onset of the disease is usually from the fourth to the tenth day. A reddened area of hyperæmia first appears which becomes whitened in the center in a few hours, followed by a raising of the epidermis into a thin walled wrinkled vesicle containing a clear yellowish fluid. Later this fluid becomes turbid. Smears from this show pus-cells with intracellular and extracellular diplococci, which in these preparations resemble the gonococci very closely but differ in that they are gram-positive. The vesicles spread rapidly by peripheral extension and in severe cases may coalesce to form large areas from which the superficial epidermis has been lifted off leaving a raw weeping hyperæmic base.

There is as a rule no rise in temperature or increase in pulse rate. The babies eat and sleep well and gain in weight and there seems to be little, if any subjective sensation produced by the lesions. Fatal cases, however, occur associated with all the signs of severe septicæmia.

Prompt isolation of patients with quarantine of the obstetric wards until the last patient has left the hospital followed by thorough fumigation and painting or calcining the infected wards and sterilizing material that has been exposed to the disease appear to be the only efficient means of stamping out the infection.

An efficient method of treating the lesions is to rupture the vesicle as soon as it forms and to apply a per cent ointment of ammoniated mercury (white precipitate ointment) to the lesion. Prophylactic and curative vaccines in doses of 15 millions are being tried but their use is too limited as yet to permit one to draw conclusions as to their value in preventing or effecting a cure of the disease.

EDWARD L. CORNELL

Ballantyne, J. W. Alcohol and Antenatal Child Welfare. *Med Press & Circ* 1916 cl 337

Ballantyne discusses the effect of alcohol upon the unborn in 3 stages fetal period of some seven months embryonic extending back six or seven weeks to eight weeks after impregnation and the germinal period when the germ cells exist in the testicles and ovaries. In the latter period the

germinal cells are exposed to the blood and nervous system influences as are the other body cells although the Graafian follicle may protect. This protection in the embryonal period is formed by the decidua and in the foetal the placenta is the protection.

Nikolux found alcohol in the cord placenta and blood of a child whose mother had received rum and milk an hour before delivery. Palazzi in 1901 found that alcoholized female rabbits were more sterile than unalcoholized ones. In the human it is hard to separate the effect during pregnancy from that before pregnancy. The author is of the opinion that the effect of alcohol on the fetal period is to cause premature labors, miscarriages still births, and hemorrhages in labor.

The effect of alcohol during the embryonic period has been worked out by using the hen egg. Charles Fere found that growth was inhibited and monstrosities were produced by injecting alcohol into the albumen of the egg. It is hard to prove this in the mammalian as the embryonic period is only five to six weeks and the protective effect of the decidua is a factor but the work of Stockard at least indirectly proves that the effect in the human is similar.

The effect of alcohol in the germinal period has been best worked out clinically as well as experimentally. On the evidence thus collected that alcohol produces the most deleterious effects in this germinal period Bezzola taking the nine thousand Swiss Idiots in 1900 found two acute annual maximum periods to correspond to the periods of carnival and vintage when the people drink most. Schweighofer has found stillbirths occurring frequently in similar circumstances.

The results of Stockard are quoted. For three years he gave alcohol by inhalation to guinea pigs for six days a week, in some cases for five years. He found bad results to the offspring in the first second third and fourth generations. The deformities were worse in the later generations. The conclusion is that the alcohol modified the chromatin of the germ cells.

From all that has gone before the author reasons that alcohol is a menace to antenatal health and life at every one of the stages of its existence and to each of the progenitors. W. F. HUPPITT

GENITO-URINARY SURGERY

ADRENAL KIDNEY AND URETER

Cabot H. and Crabtree E. G. The Etiology and Pathology of Non-tubercular Renal Infections. *Surg. Gy. & Obst.* 9:6 Jan, 1915

Cabot and Crabtree point out the hopeless confusion existing concerning renal infection. Lack of uniformity of opinion is due first to failure to recognize that different forms of bacteria do not produce identical renal lesions. They emphasize what appears to be the fact that non-pathogenic bacteria, particularly the colon group of bacilli, tend to produce non-suppurative temporary renal changes, while the pathogenic group particularly the cocci tend to produce suppurative nephritis and abscesses. Second exception taken to the loose use of the terms metastatic hematogenous embolic, excretory ascending and lymphogenous also to the tendency of pathologists to describe and consequently clinicians to recall the various stages of the same infective process as distinct disease entities, where in fact they are but stages of the same process like use to the futility of the attempt to study renal infection in advanced stages of the disease particularly where infection is superimposed upon another process, such as stone and hydronephrosis.

The authors review the literature of the subject of renal infection and produce evidence to support the following propositions: (1) Bacteria circulate in the blood and are excreted by the kidneys with or without the production of renal lesions. (2) Bacteria circulate in the blood and are excreted with the production of lesions, mild or severe. The type of lesion produced is dependent upon the variety of bacteria and its ability to produce pus. In support of this proposition a group of cases diagnosed pathologically as suppurative nephritis were examined by staining for bacteria in sections. A statistical review of these cases is appended.

Of 118 kidneys consisting of surgical specimens and autopsy material 58 showed no bacteria. Of the remaining 60, 3 showed staphylococci alone, 4 streptococci alone, 3 streptococci and staphylococci. Of 5 cases of mixed cocci and bacilli, 10 showed staphylococci and gram negative bacilli, 4 streptococci and gram negative bacilli and 3 staphylococci streptococci, and gram negative bacilli. Few cases only showed bacilli alone of these, 3 showed bacillus coli only, colon pyelonephritis and 2 showed bacillus coli and another — a pathogenic bacillus.

The authors attack the ascending and lymphogenous routes of infection. From the mass of clinical and pathological evidence accumulated,

they are led to believe that renal infection is practically always blood borne.

From these considerations, it appears that an accurate diagnosis of the infecting organism is of distinct significance in the treatment of renal infections. The colon group of bacteria produce infections which are essentially non-surgical conditions except when seen late as pyonephrosis. In the early stages they are distinctly amenable to treatment with formaldehyde-containing drugs. On the other hand a coccus infection of the kidney is essentially a surgical condition. A few of these cases heal spontaneously yet in those instances where the infection goes on to abscess formation not only are formaldehyde-containing drugs useless but surgery is imperative.

Diagnosis of these two types of infection can be made with accuracy.

Furness H. D. Renal Tuberculosis. *A. F. S. J. Med.* 9:6 xvi 1913

Thirty-three personally observed cases were analyzed to show the relationship to previous tuberculous infections of other organs. The points noted were the first symptoms, predominating complaint, the age incidence, the natural history, the diagnostic points and the operative results.

In 10 per cent there was a history of other tuberculous lesions, 50 per cent of which gave evidence of long duration.

With respect to first symptoms, cystitis occurred in about one-half of the cases. Microscopical hematuria was the first symptom in 15 per cent, but this was so closely associated with symptoms of cystitis that the author feels convinced that the hematuria is vesical instead of renal in origin, and marks a beginning acute cystitis or an exacerbation of an already existing cystitis. Hematuria, thus considered, brings the percentage of cystitis as the first symptom up to 85 per cent.

In 5 per cent of the cases, renal or ureteral pain was noted as the first symptom. At some time in the course of the disease, macroscopical hematuria occurred in 50 per cent and in the other remaining cases almost all had red blood-cells in the urine microscopically. Pyuria was present to a greater or less extent in every case. Tubercular bacilli were found in slide preparations in 85 per cent, and the author considers that this high percentage would have been higher had experts made the examinations. He used Crabtree's method of search — low speed centrifugation to throw down the pus-cells and subsequent high speed centrifugation of the supernatant fluid, in the sediment of which the bacilli are easily found.

In no instances did he find a positive guinea pig reaction where there was failure to find the bacilli in the smear and in two instances the smear was positive and the pigs negative.

The importance in diagnosis of palpation of the ureter through the vagina is emphasized by its having been thus felt in 45 per cent of Furniss's cases. He considers this a great help in determining which is the affected kidney in advanced bladder involvement. He opposes attempts to catheterize the ureter of the involved side but considers necessary catheterization of the supposedly healthy side in order to determine if it is likewise involved. All but 4 of the 33 cases had nephrectomies. The author strongly advocates because of the unsatisfactory results obtained by him in the various methods of treating the ureter (such as simple ligation and division with cautery carbolic injections implantation on the skin closure with or without drainage) excision of the whole ureter down to the bladder with the kidney. In one case in which this was done the technical difficulties were slight and the results most satisfactory. The results show no operative death and only two postoperative deaths one of pulmonary tuberculosis and the other of general military tuberculosis. About 30 per cent had postoperative anuses one draining as long as two years. The results in advanced tuberculosis have apparently been better after operation than in those who have had the trouble for a short time. Thirty five per cent have been cured and all of the others except one which showed secondary involvement of the other kidney and the two that died have improved.

FRANK HINMAN

BLADDER, URETHRA, AND PENIS

Howard, H. W.: Fibrosis of the Bladder Neck as a Cause of Urinary Frequency. *Northwest Med.* 19 6 xv 368

The author discusses the subject of fibrosis of the bladder neck, laying particular stress on diagnosis differential diagnosis, symptomatology and treatment.

The symptoms of this condition are frequency, a sense of obstruction, and intermittent dribbling or leaking; there is an absence of pain and it may occur at any age. The sexes are affected about equally. There may or not be an antecedent history of gonorrhea or trauma, but there is a history of very long standing.

Among the changes in the vesical neck, there is an asymmetry of the sphincter rim, the rim instead of being perfectly circular will be flattened in one or more segments; the asymmetry may be confined to a single segment or it may be very extensive and affect two or more segments separated by sharp receding angles.

Howard claims the asymmetry is fundamentally due to a connective tissue increase and contracture and that cysts, glandular changes, villi, papillae, and epithelial hyperplasia etiologically associated with

chronic inflammation are conditions pathognomonic of contracted neck because of the implied connective tissue changes accompanying.

Differentiation is required from hypertrophy of the prostate, tabes, and colliculitis.

Howard states that the present therapy is practically limited to stretching by the Kollman dilator and it is necessary that the dilator be so disposed as to bring the largest diameter in contact with the part to be stretched. Each subsequent stretching will be one point greater than the preceding and the treatment should be continued until the full capacity of the instrument is attained and maintained.

LOUIS GROSS.

Lauterman M. Appendicovesical Fistula. *Canad. M. Ass. J.* 1916 vi 910

The author cites a very interesting case of appendicovesical fistula. It is extremely interesting to trace the development of this condition from its inception to its cure by laparotomy from the patient's history. First there was constipation, second a severe attack of constipation, accompanied by severe abdominal pain and fever which lasted for ten days. The patient made an incomplete recovery, his right side feeling lame.

Two months later after having passed no urine for five hours the patient had a severe pain in the right side and voided about one pint of cloudy urine mixed with blood and some slimy matter. An hour later he passed a considerable quantity of gas from the urethra, having a fecal odor. The patient still continued to go about, but at each passage of urine the last part was always thick and contained a mucilaginous substance. Occasionally he passed particles of brownish or greenish brown material, irregular in form, size and consistency. Air also bubbled from the urethra each time he voided. Later while urinating he experienced a sudden sharp pain in the penneum which extended along the urethra to the glans penis. Urine was dribbling from the urethra and the pain was very severe. The patient experienced considerable shock. The urethroscope was passed and a white body was seen in the posterior urethra. This was removed and proved to be a kernel of corn which had been eaten seven hours previous. Cystoscopy showed two inches above the right ureteral opening an irregular shaped slit with ragged edges which allowed the tip of the cystoscope to enter. Its removal was followed by a flow of fecal matter which flooded the field.

Operation was performed under ether anesthesia. The ureter and fistula were previously catheterized. The abdomen was opened through the right rectus. Adhesions of cecum to the peritoneum and bladder were encountered and separated; the tip of the appendix was free and pointing to the patient's left side. The body was adherent to the right side of the posterior wall of the bladder for about two inches. The catheter in the side could be felt passing into the cecum. The appendix was carefully dissected

free from the cecum, tied off and cut through with a cautery knife the stump was inverted with a purse string suture. The appendix was now freed from adhesions to about one-quarter of an inch from the edge of the fistula opening. Peritoneum covering was cut through all the way around and the pedicle thus formed tied off with catgut. The appendix was cut through with scissors. The outer wall of the bladder was then sutured over the stump and the cut edges of the peritoneum sutured over the whole. The catheter was left in for forty-eight hours. The patient left the hospital the eleventh day after the operation.

Cystoscopic examination four weeks after the operation showed the spot where the opening had been the bladder mucous membrane was healthy, but there was still colon infection of the urine. This was treated with lactobacilli and irrigation with sodium acetate solution. A. D. L. 42

Greenberg, G. Cystoscopy as a Diagnostic Aid in Spinal Cord Diseases. *U. S. Rev.* 9 614

Cystoscopy is an important aid in the diagnosis of spinal cord diseases. With lesions of the bladder center in the spinal cord there is a diminution in the reflex excitability of the bladder wall and this allows the patient to go for hours without bringing on the desire to urinate. The changes in the musculature are likened to those of the heart where dilatation and hypertrophy go hand in hand. In the spinal cord cases the trabecular dilatation most commonly found is on the roof and lateral wall while in the obstructive type the trabeculae are better developed on the lateral wall of the bladder. When the lesions are in the anterior horns of the cord there is an early incontinence due to paralysis of the sphincter.

It behooves us, therefore, to examine the nervous system of every patient who presents himself with urinary disturbances and if no signs be present provided the local condition is not contraindicated, to cystoscope him, and if such physical signs as have just been described are present and in addition they are associated with chronic constipation which began at about the same time as the urinary difficulties, then it is almost certain that the patient is afflicted with a grave nervous lesion of the cord which will sooner or later manifest itself with all the other characteristics. A. D. L. 42 PENANCE

GENITAL ORGANS

Hertzel, A. E. Ectopia Testis Transversa with Infertile Uterus. *Surg. Gynec. & Obst.* 9 6 xxi 597

The author reports a case in which the right testicle had accompanied the left into the left side of the scrotum. Between the testes was a diminutive uterus. The author has collected thirteen cases of transposition, in one of which there was a small uterus.

Zigler, M. Testicular Syphilis. *J. M. J.* 9 6, 1 993

The author prefaces his reports of three cases of testicular syphilis with a quotation from Symmer: "There is a syphilitic lesion of the testicle characterized by slowly progressive hyperplastic changes in the connective tissue constituting a complete partial sclerosis of the organ, the so-called chronic testicular orchitis." Among 172 male subjects of late acquired syphilis in the Bellevue Hospital series chronic interstitial orchitis was found 67 times or 39 per cent. In connection with the general subject of testicular syphilis it is worthy of emphasis that in not one of the 314 cases of fatal acquired syphilis did we encounter gummata of the testicle proper.

Since almost 40 per cent of adult syphilitic males eventually acquire syphilis of the testicle it behooves us to be more on the watch for chronic orchitis and all cases with testicular involvement where the diagnosis does not readily fall into either the gonorrheal or tuberculous class should receive the benefit of a Wassermann and a thorough therapeutic test. If this is done syphilis of the testicle will respond to treatment as elsewhere in the body. The following cases are reported.

The first patient, age 30, had had a venereal sore four and one-half years previous. Six months later the right testicle suddenly became swollen. Two months later the left testicle also became swollen. A diagnosis of tuberculosis of the testicles was made and operation performed without removal of the organs. After the operation the testicular condition grew worse and sinuses developed. Tuberculin, rocasote and cod liver oil were given without improvement.

At operation both testicles, badly degenerated, were removed. The laboratory report was gummata of both testicles. The blood Wassermann was found to be plus four. Vigorous antisyphilitic treatment was followed by restoration to normal health.

Nineteen days after the operation the breasts became enlarged and continued so for two months. The author raises the question as to whether this is a compensatory process of the mammae to make up for the loss of internal secretions of the testicles.

The second case, age 38, had had gonorrhea eight years before. He denied having had syphilis. After operation for double inguinal hernia both testicles became swollen. An abscess developed in the left and it was removed. The right continued to be swollen and hard. Blood Wassermann was found to be plus four. Under iodides and mercury the testicle rapidly diminished in size with general improvement of the patient.

The third case, age 33, ten months ago had had an initial lesion on the index finger. Ten months later secondaries developed. Blood Wassermann was positive. He received salvarsan and mercury injections. When the symptoms disappeared treatment was stopped for several months. The left

testicle suddenly became painful and enlarged. Hydrocele developed. It was tapped several times but refilled promptly. After administration of mercury and iodides the condition promptly cleared up.

In the first and second cases early diagnosis unfortunately was not made so that the former lost both testicles and the latter one. In the third case the diagnosis having been made earlier the patient was possibly saved from a fate similar to patients one and two.

All syphilitic testicles do not go on to gumma formation but even the rare possibility should be emphasized so that early diagnosis, followed by prompt and intensive treatment, may be instituted.

H. G. HAMER.

Shrophire, C. W., and Watterston, C. The Relation of the Prostate Gland and Seminal Vesicles to the Arthritides. *South M J* 1916 ix, 911.

The absorption of toxic substances from diseased tissues such as are found in tonsillitis, prostatitis, seminal vesiculitis and abscesses at the root of the teeth may cause inflammatory conditions in or about the joints. This is probably due to the fact that the joints are subject to considerable traumatism during exercise. In the course of a gonococcus urethritis it is not unusual for a patient to develop an arthritis or a perioritis. But strangely this occurs only after the posterior urethra is invaded showing that toxins are not absorbed from the anterior urethra but that absorption takes place from the posterior urethra, prostate, and seminal vesicles. Thus was developed Fuller's operation of seminal vesiculotomy. Later numerous pathogenic organisms were isolated in these infections. The relation of the prostate and seminal vesicles to the urinary tract shows why so many pathogenic organisms from the upper part of the urinary tract such as streptococcus, staphylococcus and typhoid bacillus reach the prostate and seminal vesicles. The same thing may be said of the anterior urethra. In addition it may be necessary to consider infection by continuity of tissue from the rectum and bema-togenous infection although the latter is very rare. Simple congestion of the prostate gland and seminal vesicles caused by constipation, excessive masturbation, the use of condoms and abnormal forms of sexual intercourse is said to be a predisposing factor of the greatest importance in infection.

The prostate gland in view of its location, performs a double function. It is first concerned with the sexual act, secreting the prostatic fluid and secondly forming as it does a part of the floor and outlet of the bladder assists in urination. The symptoms are therefore sexual, urinary and general. The general symptoms are irregular but the most consistent are pain in the lumbar region, severe pain in the coccyx, stiffness in the muscles attached to the tuberosity and the spine of the ischium causing a stiffness when the patient arises after sitting a few minutes, tender heel inflammation in or about the

joints, arthritis, periarthritis or perioritis. Symptoms referable to the vesicles can also be divided into sexual, urinary and general. The general symptoms are approximately the same as in prostatitis.

Contrary to the general belief the prostate need not be enlarged to be diseased and a diagnosis should be made on the character of the secretion obtained. If this secretion contains pus after massage even though no pathogenic organisms are found the patient is suffering from prostatitis and should be massaged until the pus disappears. It is not always possible to find organisms even by culture. It is said that the vesicles are diseased if it is possible to palpate them and this is true in a majority of cases. In the author's experience ability to palpate the seminal vesicles together with tenderness on pressure is very suggestive of a pathologic condition which is confirmed by finding pus-cells in the secretion. In severe cases of seminal vesiculitis it is impossible to obtain any secretion whatever because the ejaculatory ducts are occluded and the vesicle is felt as a fluctuating mass sensitive to pressure.

C. R. O'CROWLEY

Barringer, B. S.: The Treatment by Radium of Carcinoma of the Prostate and Bladder; Preliminary Report. *J Am M Ass* 1916 lxvii 1443.

The cases considered in this paper are not papillomata which may have undergone carcinomatous degeneration at one place or another but rather flat sessile tumors sometimes cauliflower sometimes hard sometimes multiple generally sluggish in part. The cystoscopic picture or the rectal feel may suggest an indurated base. Microscopically they show carcinoma. Fulguration does not particularly affect this tumor. The method which Barringer uses at present is as follows. From 100 to 200 milligrams of radium screened with 0.6 mm. of silver and 1.5 mm. of rubber are put up so as to form a capsule about one inch long and one-eighth inch in diameter to this is attached a long stout double linen thread. A direct cystoscope is introduced into the bladder the capsule put through its sheath and the cystoscope withdrawn leaving the radium in the bladder. The linen thread attached to the tube runs through the urethra and appears at the meatus. The patient remains in bed during the application. The capsule does not interfere with urination.

Nine bladder tumors have been treated by the method above described with the following results. One patient died three months after irradiation. This patient had an extensive inoperable carcinoma of the bladder base. Three patients had been too recently treated to make any report. In two other cases the symptoms are about the same and the patient's general condition is slightly improved but the carcinomata still persist. In two of the nine cases the growth had disappeared. One has only been recently examined cystoscopically.

notwithstanding the radium was applied in January 1916. In the other the growth has been absent by cystoscopic examination for three months. In both of these cases microscopic sections of the tumor showed carcinoma.

The problem involved in the diagnosis and treatment of carcinoma of the prostate is different from that of carcinoma of the bladder. Because the carcinoma starts in the neck of the prostate gland, and radium by urethra or rectum often causes intense irritation. Barringer has applied the radium by a different method. A needle 4.5 inches long and about 18-gauge has been used. From 50 to 100 millicuries of radium have been placed in the end of this needle for a distance varying between three-fourths to one and one-half inches according to the indications of the individual case. The patient is placed in a lithotomy position. A finger is introduced into the rectum and the perineum between the urethra and rectum is anesthetized with novocaine 1 per cent. He has frequently inserted the needle without an anesthetic causing very little pain. The needle is plunged into the perineum between the urethra and rectum and guided by the rectal finger the end of the needle is passed into the middle of one of the other of the carcinomatous lobes. After the needle is introduced the patient frequently does not feel its presence. The needle is left in place from four to six hours. If it is desired to irradiate the other lobe the needle is pulled out of the first lobe and introduced into the second and left there the proper time.

Five patients have been treated by the needle method. In but one of these cases was a specimen obtained for pathologic examination. One patient died two months after the treatment. He had an extensive carcinoma of the prostate and vesicles. One of the patients has been too recently irradiated to determine the result. The other three patients have all improved symptomatically.

The following summary is made. Nine cases of bladder carcinoma have been treated and two of these have shown the complete and rapid disappearance of the growth. These cases were carcinomatous by cystoscopic appearance and microscopic examination. Time only will tell whether these patients are cured. In one case of prostatic carcinoma, treated for six months, the carcinoma and the symptoms have markedly regressed. In another case, treated three months possibly borderline the symptoms have improved. Of three other patients treated, one is dead, one has only recently been treated, and one is doing a full day's work and could not be reached for examination.

C. R. O. CAWRA.

Shipley A. M., and Lynn, F. S. Some Remarks on Prostatectomy. *South M J* 9 6 iv, 985.

The authors confine their remarks to the subjects of infection and hemorrhage associated with prostatectomy discussing the various methods of treat-

ment in these conditions and giving the plans they consider of greatest value.

In hemorrhage all methods have been tried and most of them found unsatisfactory with the exception of Deaver's method of ligature and suture, which they find most certain and efficient.

In regard to infection the authors use either a freshly prepared suspension of Bulgarian bacilli the usual dose of 3 to 5 ccm daily or three tablets are crushed in several ounces of sterile water and injected once daily. The bladder is irrigated with sterile water through a catheter and the Bulgarian bacilli are then injected. They have used it with most beneficial results as a preliminary preparation for prostatectomy.

They report their results in a few cases and in conclusion state that the efficacy of this treatment has been demonstrated not only as a palliative measure and as a preparatory measure to operative treatment but also as a postoperative measure.

LOUIS GRIS

Cabot H. and Croftree, E. G. The Mechanism of the Protection Afforded by the Drainage of Prostatitis as a Preliminary to Operation. *Boston M & S J* 9 6, clxxv 633.

It is now generally accepted that preliminary drainage before operation for prostatic obstruction is an important factor in reducing the mortality in such operations. The authors give a concise clear logical statement of the results of their studies of the mechanism of protection which such preliminary drainage affords. They also give most interesting suggestions to the practical application of the deductions which they have made. The following abstract presents the chief point of their communication but the paper should be read in its entirety by all interested in this field of surgery.

The importance of preliminary drainage is by no means equal in all cases presenting themselves for operation. It is most essential in the cases with overdistended and uninfected bladders, it is least required in the patients with thoroughly infected bladders but regularly emptied—patients leading a catheter life. Between these two extremes are placed the cases with moderate residual without infection.

The benefits resulting from preliminary drainage depend upon two factors: (1) relief of back pressure with resulting equalization of kidney circulation, and (2) infection—pyelonephritis. This infection occurs in the majority of cases and is particularly difficult to avoid in cases with overdistended uninfected bladders. The probability of infection is increased by the use of an indwelling catheter.

The relief of back pressure upon the kidney and the infection of the kidney which accompanies drainage so commonly both affect renal function. For the determination of renal function the phthalein test is regarded on the whole as the most useful measure.

Grouping together all cases with residual urine, large and small infected and uninfected drainage is followed first by a drop in function, second a period during which the function remains more or less low and third a return of function to a point somewhat below the original level, but sometimes equaling or even exceeding it. The greatest fall is to be expected in cases of recently overdistended uninfected bladders while the least reaction is seen in cases with a moderate infected residual. The great reduction in function occasionally seen is believed to be due to a composite process in part due to acute congestion of the kidney following the relief of back pressure and in equal part due to infection pyelonephritis.

Opportunity was afforded to study these two factors separately in a small group of cases. The depression of renal function in each group of cases is shown graphically by charts. With the operation of these two factors more clearly understood it is possible to explain why the greatest drop in function should occur in the overdistended uninfected and little or no drop in the moderately distended infected. In the former case two factors tending to reduce kidney function become operative about the same time.

The patient with infection is exposed to the drop in function resulting from what is called decompression, but is protected from an intercurrent pyelonephritis by the immunity which he has established as a result of a previous infection. This is believed to account for the notoriously better results of emergency operations upon patients leading a catheter life.

Before the days of preliminary drainage, mortality was high in the overdistended uninfected. These patients were expected to survive three more or less lethal assaults. All tending to depress renal function and all attacking him at substantially the same time namely decompression, congestion, operation and pyelonephritis. Drainage has had the effect of separating these factors in point of time so that decompression comes first pyelonephritis second and if the patient survives, operation third.

Less attention has been paid to intercurrent infection than it deserves. The authors believe this form of infection largely produced by the colon bacillus, is confused in the literature with what is called pyelitis. That this infection actually involves the kidneys and is to be considered as an excretory type of infection is evidenced by the marked depression of renal function which accompanies it. There is a moderate amount of pathological evidence in support of this view. A case in point is detailed. Permanent changes which occur are found in the pelvis producing a chronic catarrhal pyelitis giving rise to a persistent bacilluria and are the source from which recurrent invasions of the kidney chiefly in its interstitial portions occur.

As to the modes of entrance of the bacilli into the circulation the evidence at hand indicates that the

infection is hæmatogenous in origin the source of the infection is in the prostate urethra, or bladder. The authors look upon the pyelonephritis following drainage as a very important factor. The immunity resulting from this infection is of more benefit to the patient than the decompression of the kidney. Hence the chief benefit to the patient of drainage is infection, not because the infection is desirable but because the immunity which results therefrom gives him a security which it has not been possible to obtain in any other way.

Based upon the above conception of the rôle and importance of infection of the kidney with the resulting immunity in operation upon prostatics the authors propose a method of producing an immunity to pyelonephritis less violent than the actual production of the disease. The method consists in the production of passive immunity by vaccination. Their work on this problem has been carried on for a period of only six months, but they have satisfied themselves that so far as agglutination can be regarded as a measure of immunity they have been able to produce it in their patients. They have worked with a single strain and with a variety of strains combined at first on uninfected cases and later with infected cases in an effort to produce immunity in the one class or to raise their immunity in the other. The authors expressly state that the above is presented only as the beginning of a piece of work in order to draw attention to it that the efforts of others may supplement their own endeavors should it seem worthy of further consideration.

H. A. FOWLER.

Loumeau: Late but Fortunate Intervention on a Prostatic with Retention Calculus, Profoundly Infected and Intoxicated and at the Same Time Attacked by Chronic Aortitis and Cardiac Hypertrophy (Tardive mais heureuse intervention vésicale sur un prostaticque rétentiviste calculeux, profondément infecté et intoxiqué, en même temps qu'atteint d'aortite chronique et d'hypertrophie cardiaque) *J. de méd. de Bordeaux* 9 6 lxxviii 183

Loumeau's patient was a man of 68 the examination of whom showed that a vesical infection was the source of his troubles and dominated the situation. After a suprapubic incision a phosphatic calculus weighing 55 grains was extracted from the midst of an enormous mass of pus.

The patient had been suffering for many years from calculous cystitis and had gradually weakened having aortic and cardiac complications moreover the prostate had become oedematous and had attained the size of an orange. Loumeau considered that the prostatectomy could be deferred and performed later as a secondary operation. As a matter of fact the vast and general improvement in the patient's condition has rendered the prostatectomy unnecessary up to the present time.

The point to which Loumeau directs special attention is the necessity of performing prostatec-

tomy in two stages in old patients who are badly attacked, instead of doing the whole operation at one time as has been the custom among all kinds of patients. Bladder operations should be distinct from those on the prostate, separated by an interval which may in some cases extend to months. In the case referred to the patient would have certainly succumbed to either shock or infection if Louneseu had attempted a prostatectomy in addition to the cystotomy at the same time.

W. A. B. I. N.

MISCELLANEOUS

Bovin, E., and Olow J. The Treatment of Genital Tuberculosis. (Die Behandlung der Genitaltuberkulose.) *T. VI. North Surg. C. 2. Goeteborg* 963 p. 17.

After giving an exposition of the modern conception of the etiology, pathological anatomy and diagnosis of genital tuberculosis, Bovin's conclusions may be summarized as follows.

In the earlier stages in which it is impossible to recognize the tubercular nature of the trouble the treatment should be the same as in the other forms of salpingo-oophoritis non-operative. If probable diagnosis of tuberculosis is made the treatment should be expectant in a sanitarium and should be supplemented by heliotherapy, radioray therapy. The patient should be observed over a long period of time. More advanced cases especially those which have not improved by the expectant treatment, should be operated upon if the other organs are in such condition that the operation will not endanger the life of the patient. In advanced cases with extensive adhesions extirpation of the entire mass should not be undertaken. A solitary tuberculosis of the peritoneum with or without ascites is not a contra-indication to the operation. The operation should be performed abdominally and not vaginally. As a general rule both tubes should be taken out. Macroscopically sound ovarian tissue should not be removed even after resection of a part. The uterus may be left intact unless an extensive involvement of the organ exists. In cases of isolated tuberculous endometritis hysterectomy should not be performed immediately; a curettage combined with proper general tonic treatment may lead to complete cure.

Bovin bases his conclusions upon 55 cases of genital tuberculosis from the material of Salin, Westermarck and his own. Of the 55 cases one died shortly after the operation from acute peritonitis, 3 died 4, 9 and 18 months after respectively from causes in part due to the operation, bowel or urinary fistula. Three patients died one and one third, 5 and 5 years after of pulmonary tuberculosis. Three patients left the hospital with open bowel fistulae, one with a vaginal fistula, and with abdominal wall fistulae. Of these 13 healed spontaneously in the course of a few months to two years. Of 43 patients who appeared for re-examination

almost all were well and able to perform their daily work one to fifteen years after the operation.

Of W. protested against the views brought out by Kroenig at the fifteenth convention of the German Society for Gynecology. His investigations of the cases at the Clinic of Lund show that Kroenig's contention that genital tuberculosis with resections leads to death is untenable. There are cases in which the genital tuberculosis by spreading to the surroundings especially to the peritoneum endangers the life of the patient. There is a fatal result in the operation if it may not be present before there is one. And since according to Olow the symptoms of genital tuberculosis are more serious than believed by Kroenig and the results of the operation so satisfactory (among 17 cases death, mechanical ileus, 2 fecal fistulae, 1 abdominal wall fistula all cured spontaneously), a re-examined patient all healthy and able to work one to nine and one half years after the operation. Olow comes to the following conclusions. Where the genital tuberculosis is the only clinically demonstrable localization of tuberculosis or where the genital tuberculosis is the only active symptom producing lesions the tuberculous organs should be removed by operation before a spreading of the lesions to their surroundings make the operation too arduous. If extensive adhesions have already formed in the abdomen extirpation of the tuberculous organs had better be omitted. The local operative treatment should always be supplemented by constitutional treatment in all its forms. In regard to the operation Olow states tuberculous tubes the complete or partial involvement should be removed entirely. Ovaries affected by tuberculosis even though only superficially and slightly hardened should be completely removed. A tuberculous uterus should in general be removed but in the middle forms of involvement an attempt with the Pfannenstiel method may be tried and a part of the ovary may be left to retain the anastomoses. In case the uterus does not show definite signs of involvement and the involvement of the adnexa is such that a portion of them may safely be left then the uterus may also be left. However the involvement of the disease is so extensive that their complete removal is necessary then the conditions found at operation technical difficulties, etc. must decide whether the uterus should be removed or not. If the uterus is left in place then the patient should be observed closely to observe whether the tuberculous process progresses and if so he should be subjected to the proper treatment.

The discussion which followed showed that a complete uniformity of opinion exists among the Scandinavian gynecologists regarding the treatment of genital tuberculosis. Operation in the early stages was the predominating note of the entire discussion.

MAJONIKER reported the following results from his own material there were 22 operated cases. One death occurred from the operation as a

result of peritonitis there were 18 uneventful recoveries 2 patients went home with an abdominal wall fistula. Further investigation showed that of 20 patients one had died of pulmonary tuberculosis one is ill of the same trouble and the others are all well and able to work daily.

LINDQUIST reported the following results 20 cases 14 uneventful recoveries 6 went home with a fistula of the abdominal wall. Of 18 who were investigated one had died 9 months after the operation from cerebral hæmorrhage. Of the others one still has pains in her abdomen and obstipation one other is unable to work on account of nervousness and one has irregular bleeding. All others are well and able to work regularly.

FROELICH reported 50 cases from Kaarsberg's clinic 25 with hysterectomy or bilateral salpingo-oophorectomy 25 with less extensive adnexæ operations. Among the former 2 died as a result of the operation later one six months after the operation from hæmorrhage and a persisting abdominal wall fistula one died of progressive genital and peritoneal tuberculosis 9 are improved and 11 are well. No report was obtained from one. Of the 25 of the latter group there were no fatalities due to the operation one died later of cerebral hæmorrhage 4 are improved and 18 are well.

No reports from 2 cases. Froelich protested against curettage in tuberculous endometritis in addition to laparotomy as advised by Olow.

L. A. JUNGKE.

Stellwagen T. C. Impotence in the Male V 1
M J 19 6 clv 879

The problem of sexual weakness or impotency is of great importance and not well understood. Many methods of treatment have been devised and numerous drugs and combinations tried with many failures.

The author reports the use of anterior lobe pituitary body in six cases, varying in age from 35 to 62 years, with apparent cures. From two and one half to five grains of the preparation were given three times daily in conjunction with tonics prostatic massage, and regulation of diet.

No untoward symptoms have been produced by the administration of the preparation except slight hyperacidity of the gastric juice.

The fact that prostatic massage and some other remedies were used in the treatment of these cases in a measure invalidates the testimony in favor of the anterior lobe pituitary body but the preparation seems to have played a decided part in the cures.

H. G. HANER

SURGERY OF THE EYE AND EAR

EYE

Castresana, B. Difficulties of Diagnosis when Development of a Choroidal Sarcoma Begins (Dificultades de diagnóstico cuando se inicia el desarrollo del sarcoma de la coroides) *Rev. méd. Madrid* 9 6 IJul 674.

A diagnosis of sarcoma of the choroid can be made by means of the ophthalmoscope using these symptoms as supporting evidence: the haze which troubles the patient, the luminous sensations, scotoma with progressively diminution of the visual field, metamorphosis when the tumor is situated on the macula, the increase of tension.

The presence of these signs added to the ophthalmoscopic observations, the abnormal position, the slight motility, the presence of a vascular net of new formation in the back of the retina in the region in which the tumor is developed, lastly the presence in this region of small hemorrhagic foci, all these form a clinical picture sufficiently perfect to diagnose melanotic sarcoma of the choroid in the early period of its evolution. W. A. BERRY.

Basterra, Tuberculosis of the Conjunctiva (Tuberculosis de la conjuntiva) *Rev. Ibero-Am. de Ocul. Méd. Madrid* 9 6 XXVI 35.

The case reported was that of a woman of 43 whose previous history showed neither tuberculosis nor syphilis. In August 95 a small pimple appeared in the internal part of the free border of the lower left eyelid which disappeared and was followed a little later by another with pus.

Later development was brought her to the clinic in the November following when an ovaloid tumor was seen in the place involved. The tumor was painless and soft. The rest of the eye was normal. The tumor was extirpated under local anesthetic followed by cauterization.

Recovery was normal and has persisted in the present time. Histological examination of sections of the removed tumor showed very palpable evolution of tubercles. W. A. BERRY.

Carrasco, E. A. Radical Extirpation of the Lachrymal Sac (Extirpación radical del sac lagrimal) *Rev. Arg. méd. argent.* 9 6 XIV 179.

The author's report is based on 10 personal interventions. "Stiedel" technique — the infra-orbital incision in the tract of the nasociliary nerve 1 cm. of a 2 per cent solution of novocaine with some drops of adrenalin — produces a complete anesthesia of the region of the lachrymal sac which is much superior to that of simple infiltration of the tissues and

is efficacious for the complete painless extirpation of the sac.

In the extirpation of the lachrymal sac an incision of the tegumental tissues as they are in exact correspondence with the topographical situation of the sac. We are consequently guided by the anatomical situation of the sac and not by that of the angular vessel because it is indisputable that although there is greater hemorrhage produced by the section of the angular vessels it is easily controlled by forceps, and instead there is obtained the greater benefit of facilitating the dissection of the upper third of the sac.

Also because the adoption of an infralagamentous incision does not remove the possibility of injury to the vessels at the dissection of the upper third of the sac which is very frequent in practice.

W. A. BERRY.

EAR

Durkee, J. W. The Relation of Ear Pressure to Nose and Ear Disease. *Laryngoscope* 9 6 LXVI 203.

By means of a water manometer and a recording instrument the intranasal air pressure was measured and the following conclusions reached:

1. It is possible by measuring the air pressure in the nose in a large number of cases to find the average pressure and to call this the normal pressure, but as there are many factors that can alter the character of respiration and in this way change the air pressure in the nose, it is not possible to call any one abnormal in which the air pressure differs from the average.

2. The determining of the air pressure in the nose or the character of the nasal respiratory curve cannot as was at first hoped be of any great value in determining the presence or absence of nasal obstruction.

3. The average measurements obtained by 30 examinations representing about 200 complete respirations made at various times upon the patients who were perfectly familiar with the passage of the catheter and because of this breathed normally during the examinations, and in whom the nose was normal is as follows: normal air pressure in the nose at the middle of the inferior meatus plus 2.5 and minus 3.4 mm. of water, in the nasopharynx plus 2.6 and minus 3.5 mm. of water.

4. In the normal nose the negative pressure during inspiration is practically always greater than the positive pressure during expiration.

5. In the presence of marked unilateral nasal stenosis there is found back of the nasal obstruction

a negative pressure that is greater than normal but also an increase of the positive pressure, and the increase of the negative over the increase of the positive pressure is only four tenths of a millimeter

6 In the side of the nose that is unobstructed the increase of both the positive and negative pressure is greater than on the obstructed side, and here the increase of the negative pressure over the increase of the positive pressure is seven tenths of a millimeter

7 It would seem that any effect the increase of the negative pressure during inspiration might have in causing a congestion and later a thickening of the mucous membrane of the nose, would be overcome by the positive pressure during expiration.

8 It does not seem possible that the increase of negative pressure that was found is great enough to cause any rarefaction of the air in the closed eustachian tube or any retraction of the drum at its outer end.

9 Mouth breathing in cases of nasal obstruction causes a lowering of both the negative and positive air pressures in the nasopharynx rather than an increase.

10 During the act of swallowing in cases of nasal obstruction there is in the nasopharynx neither a negative nor a positive but just atmospheric pressure.

11 From the above investigations it can be said that in cases in which there is nasal obstruction, the negative air pressure in the nose and nasopharynx during inspiration with the mouth closed or open, or during the act of swallowing is not to be considered a cause of ear disease. OTTO M ROTT

Crane, C. G : Double Cavernous Sinus Thrombophlebitis Secondary to Middle Ear Infection Without Involvement of the Mastoid or the Other Venous Sinuses. *Laryngoscope* 916 xxi, 1283

A detailed case report is given followed by a review of the literature

In this case the infection in the middle ear passed through the veins of the diploe or the veins of

Breschat which are numerous in the petrous portion of the temporal bone. These veins connect the veins outside the skull with the venous sinuses through the numerous cerebral veins. The veins of the diploe in the region of the tympanum connect with the inferior cerebral veins. The middle cerebral vein which was found on autopsy to be filled with pus, is the largest of the inferior cerebral veins and it pours its blood directly into the cavernous sinus. The vein of Trolard commences on the parietal convolution and passes horizontally along the fissure of Sylvius and pours its blood into the anterior part of the cavernous sinus. This vein also receives blood from the diploic veins. It was through these veins that the infection in the middle ear found its way into the cavernous sinus of the same side and the circular sinus made further progress to the other cavernous sinus inevitable.

OTTO M ROTT

Putnam, F. J : Suppurative Mastoiditis — a Surgical Emergency. *J. Lancel* 19 6 xxxvi 53

The author makes a plea for early operation particularly when daily tests and observations show that the disease is progressing or what is the same thing that the condition is not improving. Three weeks is usually long enough to wait for spontaneous cure. Longer delay imperils the hearing power of the diseased ear as well as inviting such grave complications as sinus thrombosis, brain abscess and meningitis. OTTO M ROTT

Law, F. M. Roentgenography of the Mastoid. *N. Y. St. J. Med.*, 1916 xvi, 517

The author discusses the value of the roentgenogram in connection with the history, clinical and laboratory findings in making a diagnosis of mastoiditis. He notes the difference in shadow density produced by the different pathological conditions. The further value of the X ray is that it is possible to show the patient the condition and thus convince him of the necessity of an operation. The picture will also show the extent of the cells as well as their size. OTTO M ROTT

SURGERY OF THE NOSE, THROAT, AND MOUTH

THROAT

Conkley, C. G. Epithelioma of Larynx Treated by Radium. *Laryngoscope* 96 9

The author reports a case and reaches the following conclusions drawn from his study:

1. Radium applied internally has caused marked diminution in the size of the enormous infiltration of the right side.

2. The vocal cord moves more freely after the radium has been applied.

3. The formation of the tumor is occupied pretty constantly with grayish exudate whether this is or is not evidence of malignant infiltration can be determined only by microscopic examination.

4. The voice is not so good as when first seen.

5. The voice is not so good as patient usually has following a hemilaryngectomy.

6. There is a late appearance of infiltration of the neck which appears to be due to the action of the radium rather than to secondary malignant deposits.

7. The patient is in good health and has taken ten pounds in weight during the past year.

8. If no treatment had been instituted the patient would doubtless have been dead before this time.

Otto M. Kott

Axhausen, G. The Operative Treatment of Supralaryngeal Pharyngeal Stenosis by External Pharyngotomy and Consecutive Plastic Operation. *Die periphere Behandlung der supralaryngealen Pharyngostenose durch Pharyngotomie, Tarsus und Lappenplastik*. *Arch. f. Klin. Chir.* 96 11, 533

Axhausen gives the details of two highly developed cases of pharyngeal stenosis in which he made a prior external pharyngotomy followed by a plastic operation about a month later. In both cases he had entirely favorable results which were permanent. He was able to establish a *perforation* so that the displacement of the larynx could principally be traced back to the pharyngeal stenosis caused by the restricted swollen and overlapping mucous membrane. By repeated laryngoscopic examinations during the healing process it was seen that the lumen of the larynx became increasingly enlarged owing to the retraction and tension of the surrounding mucous membrane, until finally the lumen was quite sufficient for easy respiration.

Axhausen thinks that in severe atonia there is undoubtedly a great advantage in the radical operation which he practiced and from its successful results in these two cases he feels qualified to express the opinion that severe supralaryngeal pharyngeal stenosis can be operated upon in a typical manner

by external pharyngotomy with a following plastic operation moreover that in a relatively short time a radical cessation of the pharyngeal stenosis can be obtained with certainty and that at the same time laryngeal displacement if present so rectified that respiration is greatly improved.

W. A. BARNARD

Imperatori, C. J. Sudden Death During Bronchoscopy. Preliminary Report from a Physiological Study. *Laryngoscope* 96 xxvi, 57

The author's conclusions based on animal experiments are as follows:

1. The pleural cavity is normally under negative pressure. But release of the atmospheric pressure with the artificial production of a collapse of the lung, and the resultant symptoms of asphyxia.

2. In the human case would or be warranted in saying that collapse of the lung would cause death, unless the conditions are exceptional.

3. Sudden pulmonary collapse otherwise healthy lung produces sufficient respiratory inhibitory impulses to inhibit respiration for a time. These impulses, in turn, through association fibers in the nucleus of the vagus sufficiently powerful to communicate themselves to the afferent inhibitory fibers of the vagus governing the heart. Thus there is a respiratory cardiac inhibition with the concomitant symptoms of asphyxia.

The painful stimuli that are produced by the puncture of the pleura and the atmospheric pressure within the pleural cavity must also be taken into account as these stimuli may be sufficiently strong to inhibit respiration for a time.

Practical conclusions reached are:

1. Extreme gentleness should be the watchword for all endoscopy.

2. To properly endoscope the bronchi, force is not necessary. Successful results are obtained by the proper manipulation of the tube and the amount of trauma is thus necessarily lessened.

3. The amount of force required to pierce the lung and visceral pleura in some instances is very slight.

4. In those cases in which a foreign body has been lodged within the bronchi for some time and knowing that the lung tissue is less resistant because of the consequent inflammation incident to the pressure of the foreign body extra precautions should be taken and extreme gentleness be used that perforation and a possible fatal outcome be avoided.

5. Sudden increase in the number of respirations during bronchoscopy and particularly during endoscopy of the smaller tubes, should put one immediately on guard against possible perforation.

Otto M. Kott

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INTERNATIONAL ABSTRACT OF SURGERY

APRIL 1917

COLLECTIVE REVIEW

FUNCTIONAL TESTS OF STOMACH DUODENUM AND PANCREAS¹

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THE attempts at the investigation of the functional capacity of various organs have yielded profitable results, and the literature of the past decade is replete with suggestions for such examinations. The question whether there is such a phenomenon as a functional disease of an organ without some underlying structural pathology is a mooted one and the preponderance of opinion seems to be that there can be no derangement in the functional activity without some inflammatory, neoplastic, or other process as a causative factor. Nevertheless the poor functioning of a certain tissue may be due to some pathology in a neighboring tissue and not in the organ itself; for example, gastric derangement is recognized as a common manifestation in appendicitis, gall-bladder disease and structural diseases of the colon. As Stockton says: "An unprejudiced view would seem to grant that a disordered nervous system may at times give rise to cardiospasm or pylorospasm but the warning should be kept in mind that we should seek the cause in some marked irritation at or near the abnormal contraction."

The purpose of function testing is of double significance. If we assume that a derangement of activity of a certain gland is the result of some structural changes in that gland the finding of such lessened function will give us a clue to the diagnosis; for instance if we were to find that the functional activity of the pancreas is below par we may assume that there is some pathological change in this gland. So also with the stomach, intestines, etc. On the other hand

granted that there is a diseased state in a special organ, for example the liver or kidneys, what is the functional capacity of the organ? A patient that has chronic hepatitis or chronic nephritis may still have enough functional compensation to carry him through many years of life. From the prognostic and therapeutic viewpoints, therefore, it is essential to know just exactly how much we can expect a certain organ to perform.

It is the purpose of this article to review at length certain tests that have been suggested for examining the functional activity of the stomach, pancreas, liver and kidneys. Especial emphasis will be placed on those procedures which in the author's hands, have given the best results and an endeavor will be made to so describe these tests that those unacquainted with biochemical technique may form an idea as to the conduction of the tests. It is regrettable that in a number of instances the name of the author has been used to designate the test which he has devised. In order to avoid such undesirable nomenclature each proper name of the test will be followed by the name of the chemical process on which the test is based.

STUDY OF GASTRIC FUNCTION

Until about three years ago it had been the custom to administer to the patient a certain test diet and after allowing it to be digested in the stomach for one hour to remove the gastric contents and analyze it for the various constituents. Such a test diet as the Ewald white

¹In the May number of this journal, Doctor Kahn will discuss Functional Tests Pertaining to the Liver and Kidneys.

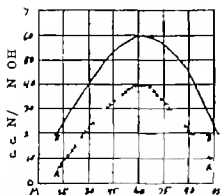


Chart 1. Addicty curves of normal human stomach AA, normal free acidity isosecretory BB normal total acidity isosecretory

bread and glass of water diet, is especially popular. This method of investigation is very well known and I shall not discuss it fully. In my opinion the results of an Ewald test meal analysis have but limited significance. Attention should be paid to the results if a marked hyperacidity is observed, report of a normal acidity or a hyponormal acidity may or may not have any special significance. I shall dilate upon this question when I discuss the Rehfuess fractional study of the gastric digestion.

Rehfuess fractional test. In 1914 Rehfuess described his method of studying gastric secretion. He devised a tube by which it is possible to follow the entire cycle of gastric digestion with practically no discomfort and by which it is possible at any given moment to draw off any quantity of the juice desired to perform the necessary chemical examinations. The tube is inserted immediately after the patient has partaken of an Ewald test meal, and specimens of gastric contents are withdrawn every fifteen minutes. This collection at fifteen minute intervals is continued until the close of digestion which is marked, as Rehfuess, Bergeim and Hawk have pointed out, by (1) the failure to aspirate any further material (2) the character of the preceding specimens (3) the character of the murmur elicited by inflating through the tube and auscultating over the stomach thus making sure that the stomach is empty and (4) lavage, which enables one to determine the presence of any food residues and their quantity. For the purpose of the chemical analyses, about 6 to 8 ccm. of the gastric contents are sufficient. The results of these examinations are plotted the abscissa being the number of minutes at which time the gastric contents were removed and the ordinate being the number of ccm. of decinormal

sodium hydroxide solution necessary to titrate the free acidity and the total acidity of the gastric contents.

The normal curves that may be obtained are of three types, according to Rehfuess and his co-workers

1 The isosecretory type shows a steady rise, high point in terms of tenth normal sodium hydroxide 40 for free acid and 60 for total acid, usually sustained for from half an hour to an hour and then a gradual decline with total disappearance of the food residues in from two to two and a half hours (Chart 1)

2 and 3 Hypersecretory and hyposecretory types are in my opinion distinctly unusual curves in normal human stomachs.

The hypersecretory type shows a rapid response to stimuli often a marked change in the acidity even of the five-minute samples rapid increase in acidity high point from 70 to 100 or over either sustained or abrupt, and a slow decline or none at all in the usual time. The food left the stomach in normal time from two to two and one half hours but even after the passage of all food material there was often encountered an outpouring of pure gastric juices for half an hour one hour or even several hours. This finding which was obtained in many cases, is so pronounced and distinct that we call it *continued digestive secretion* in contradistinction to *hypersecretion* because it occurs in normal symptomless persons. This type we call the hypersecretory type because of the general tendency of the acidity to assume exaggerated proportions (Rehfuess, Bergeim and Hawk).

In my experience such curves are not to be met with in symptomless persons.

The hyposecretory type shows a slower ascent than the isosecretory curve a slower response to stimuli and a high point from 40 to 50. This type is rarely met with.

It is in the change of function due to gastric disease that the gastric analysis curve is of such great diagnostic aid. From this curve we can obtain information which a single analysis made one hour following an Ewald test meal could never yield. I can not do better than quote the conclusions of Rehfuess as to the limitations of the usual Ewald test meal analysis

1 It is impossible to interpret the figures obtained by the examination of the test meal removed in one hour by the usual technique

"2 The one hour period represents but one phase in the constantly changing cycle of gastric digestion. While it is true that in a certain proportion of normal cases the high point is to

be found at the one hour interval, this is by no means always the case and pathologically every deviation from this type may be encountered

3 It is impossible to judge what has preceded or what will follow this point, data absolutely necessary to a complete understanding of the case.

4. Delayed digestion many forms of hyperacidity, hypersecretion symptoms of early catarrh occult bleeding are in many cases entirely overlooked by the customary examination.

5 So-called normal figures at the one hour point cannot be interpreted in the light of a single isolated phase examination They may mean (1) a perfectly normal curve (2) they may be followed by a marked hyperacidity hypersecretion and motility disturbances at a later period (3) they may be only one point in a continued high acidity and hypersecretion such as is encountered in obstructive cases (4) a form of larval hyperacidity (Chart 2)

6 Hyperacid figures may be part of an abrupt rise and equally rapid fall or they may be part of a sustained persistent hyperacidity accompanied with marked hypersecretion and evidences of beginning or pronounced motor disturbances factors impossible to demonstrate by the ordinary examination

7 Subacid figures may be part of a general subacid curve or they may mean a simple delay in digestion with its complete evolution at a later period. Finally by no means rare subacid figures at the one hour point may be followed by hyperacid figures at a later stage in digestion

8. The ordinary method can give us evidence of nothing but the crudest anomalies in motor function. The fractional method enables us to determine precisely the end point of gastric digestion

9 In the studies of the complete gastric cycle every form of secretory and motor disturbance has been found. The symptom like the actual motor secretory disturbance by no means respects the hour period and may be found depending on the nature of the case at any point in the gastric cycle

The curves that may be obtained by the Rehfuess fractional method in gastric ulcer duodenal ulcer and in gastric cancer are rather typical.

In cases of gastric ulcer the ascent of the curve is rapid and may reach its maximum before the hour or a little after. The high point in the free acidity may be between 60 and 70 and the total acidity between 100 and 110. There is then in a gradual or sudden decline as the stomach empties itself. Blood may of course be found in

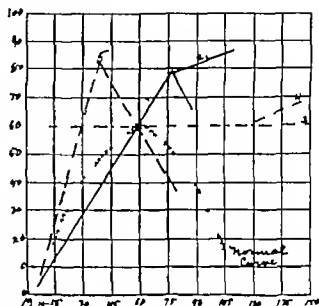


Chart The inadequacy of the one-hour gastric examination. The possibilities of the gastric curve with a normal acidity at the one-hour period. 1 hyperacidity 2 persistent hyperacidity 3 continued hypersecretion 4 prolonged digestion 5 larval hyperacidity (After Rehfuess.)

the fractions removed. The typical analyses of the secretion in cases of gastric ulceration confirmed by operation are given in the following tables

TABLE I

| Miss W. (Chart 1) | | | M. M. | |
|-------------------|-----------|------------|-----------|------------|
| Time | Free Acid | Total Acid | Free Acid | Total Acid |
| 5 minutes | 33 | 74 | 35 | 45 |
| 10 minutes | 34 | 60 | 30 | 60 |
| 15 minutes | 60 | 60 | 3 | 80 |
| 20 minutes | 64 | | 34 | 84 |
| 25 minutes | 42 | 90 | 64 | 90 |
| 30 minutes | 3 | 88 | 65 | 95 |
| 35 minutes | 39 | 75 | 4 | 70 |
| 40 minutes | 15 | 60 | 24 | 44 |
| 45 minutes | 35 | 6 | 30 | 35 |
| 50 minutes | 20 | 40 | empty | empty |

In duodenal ulcers the ascent of the curve is gradual. The height of the curve seems to be reached when the stomach is emptying itself and the reflex irritation of the food passing over the diseased duodenum stimulates the secretion of the gastric juice. Table II shows the result of the analyses by the fractional method of two cases of duodenal ulcer confirmed by operation.

TABLE II

| Mrs. B. (Chart 4) | | | Mrs. F. | |
|-------------------|-----------|------------|-----------|------------|
| Time | Free Acid | Total Acid | Free Acid | Total Acid |
| 5 minutes | 0 | 40 | | 20 |
| 10 minutes | 14 | 34 | | 33 |
| 15 minutes | 8 | 60 | | 45 |
| 20 minutes | 40 | 60 | 33 | 70 |
| 25 minutes | 40 | 60 | 43 | 68 |
| 30 minutes | 14 | 84 | 48 | 8 |
| 35 minutes | 50 | 00 | 16 | 80 |
| 40 minutes | 8 | 00 | 80 | 08 |
| 45 minutes | 06 | 8 | 06 | 6 |
| 50 minutes | 06 | | 08 | |

It will be seen from these analyses how inefficient the ordinary one-hour examination would have been. The report would have been total acid 56 and free acid 38 (Mira. F) and the conclusion would have been reached that this was a case of hypo-acidity and one would begin to suspect stasis, malignancy etc. In reality the fractional method shows this to be a case of hypereacidity pointing toward a duodenal ulcer.

In pyloric carcinoma the curve that is usually present is the following in my experience. The free acid is either entirely absent or rises to a point between 10 and 15 after one hour. The total acidity may on the other hand be normal or even above normal. The following analysis of gastric carcinoma confirmed by operation is rather typical. Blood and lactic acid were very heavy.

TABLE III

Mira. C. Chart 3

| Time | Free Acid | Total Acid |
|------------|-----------|------------|
| 5 STIMULUS | | 30 |
| 30 MINUTES | | 25 |
| 5 SILENT | | 15 |
| 30 MINUTES | | 10 |
| 5 SILENT | | 10 |
| 30 MINUTES | 5 | 30 |
| 5 SILENT | | 30 |
| 30 MINUTES | 5 | 30 |
| 5 SILENT | | 30 |
| 30 MINUTES | | 30 |
| 5 SILENT | | 30 |

In carcinoma of the cardiac end of the stomach, both the total and free acids are low due to lack of obstruction.

In my opinion the analyses of the gastric secretion by the Rehfuess fractional method yields results of great significance and of distinct aid in the diagnosis of diseases of the stomach and duodenum.

Reflex irritation due to gall stones, appendicitis etc. may influence the gastric curve markedly and give results simulating ulcer. This must always be borne in mind.

PROTEIN CONTENT OF GASTRIC SECRETION

On the assumption that malignant disease of the stomach is accompanied by degeneration processes which liberate debris and protein matter into the stomach cavity Salomon recommended a test which he thought was diagnostic of cancer of the stomach. The theoretical assumption is in accordance with our knowledge of cancer in general, and the results reported by various observers would seem to bear out the theory. It must be remarked however that such diseases as gastric ulcer would also cause a gastro-albuminemia, as has been demonstrated by several opponents of Salomon's test.

Salomon's method for testing the stomach contents for the albumin fraction is as follows. The

stomach is first carefully washed on the evening before testing after a preliminary non-albuminous fluid diet has been administered for twenty-four hours. The next morning the stomach is thoroughly washed with normal saline solution, 400 ccm. the same fluid being repeatedly used and then tested for the quantity of nitrogen by the Kjeldahl method and for the quantity of albumin by the Esbach method.

Salomon found the nitrogen content in non-carcinomatous cases to be between 0.02 and 0.16 milligrams per 100 ccm. of fluid. His study of six cases of cancer of the stomach revealed between 10 and 70 milligrams of nitrogen per ccm. and the albumin content was between 0.06 and 0.5 parts per thousand. According to Salomon a case is extremely suspicious of carcinoma if the nitrogen content is more than 30 milligrams per 100 ccm. of the fluid, or if the Esbach test gives a distinct precipitate.

Wolff and Junghans modified the Salomon technique somewhat. They determined the albumin by the phosphotungstic acid reagent. They obtained very good results. Smith found that the Wolff Junghans modification is of decided value. Another modification of this test has been recommended by Goodman who desired to eliminate the labor involved in the Kjeldahl determination. He analyzed the gastric contents for phosphorus.

Katznelson studied the reaction of Wolff Junghans in 21 cases of achylia and in 14 with various degrees of acidity but all without blood to be detected in the stomach. He did not wash the stomach before giving the test breakfast. In 9 cases of malignant achylia with complete absence of hydrochloric acid and total acidity not exceeding 16 or total anacidity as in 7 of this group he found the albumin index between 300 and 400. In 10 cases of benign achylia the index ranged from 20 to 30. In 2 cases of doubtful achylia, cancer probable, it was 100 to 400. The reagent is a mixture of 0.3 parts phosphotungstic acid 1 part hydrochloric acid 30 parts alcohol and water 200 parts. They apply the test to a set of beakers containing the stomach content diluted in turn from 0.25 up to 10 per cent. In each beaker one drop of reagent is superimposed on the diluted stomach content. The index is the dilution in the first beaker in which no ring forms at the point of junction with the reagent. The albumin index is thus the figure representing the dilution 10 20 40 80 100 200 or 400. In Katznelson's cases, he thus found the albumin index in 9 cases of gastric cancer from 300 to 400—average 355. In his 10 cases of benign achylia

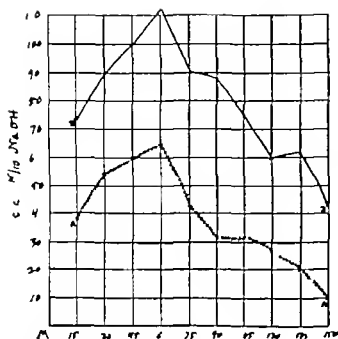


Chart 3. Mrs. W. gastric ulcer AA free acid BB total acid.

it was only from 20 to 80—average 55. Hence it seems that an albumin index below 80 speaks for benign conditions, above 100 for malignant forms of achylia. As this test is so very simple it must be considered an extremely valuable method for differentiating between malignant and benign achylia. Cases in which even small amounts of hydrochloric acid are present are not suitable for this test, as there is liable to be considerable albumin in the stomach content. The index ranged from 100 to 400 in 14 patients with different proportions of hydrochloric acid in their stomach content although cancer could be positively excluded.

Siegel concurred with Salomon's opinion, concluding from his own results that a figure over 25 milligrams of nitrogen per 100 ccm. is suspicious of gastric cancer. Orłowski, Schuttenhelm and Lowejs, Zerkelbach Witte, and Schupfer are convinced that the Salomon test is of value. Gerster regards this test as useful in cancer of the lesser curvature without stenosis, unless the cancer has formed on an old ulcer in which case the little hydrochloric acid present would digest the albumin present. Zerkelbach, however, is of the opinion that the minimum nitrogen content suggestive of cancer is 30 milligrams nitrogen per 100 ccm. of the washing fluid. Berent and Guttmann, Romano, Minkowski and Yague have reported very unfavorable results with this test. Goodman, on the basis of his findings with his

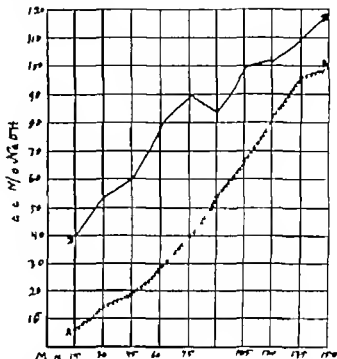


Chart 4. Mrs. B. duodenal ulcer AA free acid BB total acid.

modified technique concluded that (1) In normal individuals and in persons suffering from diseases exclusive of carcinoma of the stomach the Salomon test gives more than 20 milligrams of nitrogen per 100 ccm. of wash water (2) not all cases of gastric carcinoma reveal more than 20 milligrams of nitrogen — the absence of ulceration is probably responsible for this (3) the test is by no means pathognomonic and can be considered as contributory only to the other symptoms (4) the phosphoric acid of the wash water of a non-carcinomatous case is less than 10 milligrams per 100 ccm. whereas in cancerous conditions it usually exceeds 10 milligrams.

Clarke and Rehfuess analyzed the gastric contents after an Ewald test breakfast for protein using the fractional method and tabulating their results in the form of a curve. They arrived at the following conclusions:

1. The gastric juice in health shows definitely a protein content of very low degree.

2. This content is increased in disease by the addition of an exudation of protein material from inflammatory ulcerous or carcinomatous mucous membranes or by the addition of partially digested and retained food residues or the swallowing of protein material such as certain forms of sputum.

3. Bread and tea alone following the composition of the Ewald meal will show in the absence of any pathologic factor a definite amount of protein corresponding to the curve or the digestive

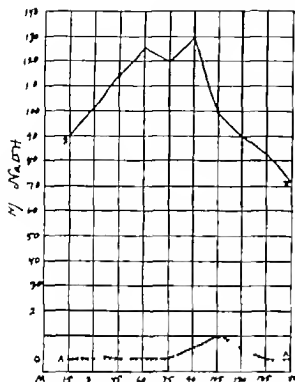


Chart 5. M. C. gastric carcinoma. AA free acid BB total chl.

power of the juice secreted. A mixture of maceration of bread in tea will show a protein content of 1:30 to 1:30 if the mixture is acted on by an artificial gastric juice *in vitro* the protein content of the juice rises steadily within the next two hours and may reach 1:320 in seventy five minutes. In other words, there is a transformation and liberation of soluble protein which may be demonstrated by the Wolff technique.

4. The pathologic significance arises when the curve shows any marked deviation from this recognized standard that is to say when there is an undue concentration of protein out of all proportion to that normally found at that particular phase in digestion. If therefore, a marked increase in protein does not conform in a general way to the acid curve it can be definitely stated that the protein is coming from other sources than the proteins of the bread.

5. An analysis of the protein would seem to demonstrate that normally it is of the nature of a protease, but in inflammatory or ulcerative conditions it is probably serum protein removed to a large extent by saturation with ammonium sulphate.

6. Attention is called to the interesting curves found in ulcer many of which showed traces of

blood, several of which can be explained on the basis of protein retention some of which must be explained on the basis of hypothetic exudation.

7. In the differentiation of achylia and carcinoma, they pointed out that the test was of value in direct proportion as the case approached a true achylia and the added factors (extrinsic) such as swallowed pus bleeding and protein residues could be ruled out. They likewise pointed out that the one hour point was insufficient for examination and that the characteristic for carcinoma in these cases is a divergence of the protein curve out of all proportion to the acid curve. Infected catarrh haemorrhagic erosions, achlorhydria, haemorrhagic gastritis, may give high findings but they do not have the tendency to give a steadily increasing protein content.

8. They believe that a study of the protein curve may yield information of the greatest value provided that all the precautions have been observed.

In interpreting the protein findings the following points must always be remembered, that there are extrinsic sources of protein. These may be (1) blood (2) the presence of pus either intragastric in origin or swallowed (3) the end-products of protein digestion still in the stomach through atony or obstruction therefore stasis lack of motor tone or actual obstruction may unduly increase the protein concentration, all of which are removed by emptying the stomach before administering the meal (4) a possible exudation of lymph or serum from ulcer (5) the exudation from a malignant lesion.

TABLE IV
ALBUMIN IN THE BASTED ABSENCE OF NON-GLASTIC CASES

| No | Name | Diagnosis | Nitrogen mg in 100 ccm | Albumin Parts P. M. |
|----|-------|------------------------|------------------------|---------------------|
| 1 | J. M. | Leukemia | 5 | Trace |
| 2 | L. B. | Debilis | 0.4 | Trace |
| 3 | M. R. | Pulmonary Tuberculosis | 7.3 | Trace |
| 4 | F. M. | Fracture | 5.0 | Trace |
| 5 | A. J. | Fracture | 4.4 | Trace |
| 6 | R. H. | Fracture | 8 | Trace |
| 7 | A. K. | Fracture | 5.4 | Trace |

TABLE V
GASTRO-ALBUMINEMIA IN CARCINOMA OF THE STOMACH

| N | Name | Nitrogen mg in 100 ccm | Albumin Parts P. M. |
|----|-------|------------------------|---------------------|
| | M. W. | 49.6 | 8 |
| | M. W. | 5.6 | 75 |
| | F. C. | 7.5 | 8 |
| | S. G. | 7 | 5 |
| | L. F. | 5.5 | 5 |
| | M. G. | 44.8 | 7 |
| 3 | Z. H. | 5 | 6 |
| 4 | A. T. | 32 | 5 |
| 5 | D. S. | 47.4 | 9 |
| 6 | E. H. | 8.5 | 5 |
| 7 | W. T. | 5 | 6 |
| 8 | A. H. | 37.9 | 6 |
| 9 | G. T. | 35.5 | 75 |
| 10 | C. F. | 49 | 75 |
| 11 | J. L. | 7 | 8 |

TABLE VI

GASTRO-ALBUMINORRHEA IN NON-CANCEROUS DISEASES OF THE STOMACH

| No. | Name | Diagnosis | Nitrogen mg in 100 ccm. | Alkalinity Parts P.M. |
|-----|-------|-------------------|-------------------------|-----------------------|
| 26 | B. | Gastric ulcer | 5.1 | |
| 27 | S. K. | Gastric ulcer | 13.4 | 4 |
| 28 | M. F. | Gastric ulcer | 4 | 6 |
| 29 | M. M. | Gastric ulcer | 23.7 | 3 |
| 30 | B. W. | Gastric ulcer | 15.0 | 3 |
| 31 | J. J. | Gastric ulcer | 8 | 3 |
| 32 | R. K. | Gastric ulcer | 8 | Trace |
| 33 | K. | Cardiospasm | 3 | None |
| 34 | M. | Acute gastritis | 25.0 | 6 |
| 35 | F. | Hyperacidity | 3 | Trace |
| 36 | Kata | Gastritis | 3.0 | None |
| 37 | L. B. | Tuberculous | 4 | None |
| 38 | T. | Hyperacidity | 4 | None |
| 39 | L. K. | Chronic gastritis | 0.8 | 3 |
| 40 | J. U. | Anacidity | 3.3 | Trace |
| 41 | M. D. | Appendicitis | 6 | None |
| 42 | S. | Hernia | 4 | None |
| 43 | M. M. | Intestinal stasis | 4.7 | None |

I have found the Salomon gastro-albuminorrhea test to be of distinct value in the diagnosis of cancer of the stomach. It will be seen from the accompanying table that the figures obtained in gastric malignancy were very much higher than the figures found in other diseases of the stomach. Care must be observed to eliminate gastric ulcer and acute inflammation of the stomach mucosa. A negative Salomon test is significant of a non-malignant condition. A positive test has to be judged discriminately.

I wish to call attention again to the fact that ordinary routine examination of the gastric contents after an Ewald test meal is of but little value as an aid to diagnosis of gastric carcinoma, as will be especially seen from the following report.

Gräb and Guthrie analyzed the gastric contents of 150 patients suffering from carcinoma ventriculi. They obtained the following results which I shall present in the form of a table. This shows how little reliance can be placed on an ordinary gastric analysis.

| | |
|---|----------|
| Free hydrochloric acid present in | 70 cases |
| Free hydrochloric acid (no blood, lactic acid, food) in | 46 cases |
| Blood present in | 80 cases |
| Blood and lactic acid present in | 20 cases |
| Blood and food present in | 15 cases |
| Blood and food and lactic acid present in | 30 cases |
| Food remnants present in | 63 cases |
| Lactic acid present in | 64 cases |

It is interesting to report here the work of Spencer Meyer, Rehfuß and Hawk on the influence of duodenal regurgitation upon the chemistry and function of the normal human stomach.

They employed fractional removal of the gastric contents by means of the Rehfuß tube. The experiments were all carried out on normal individuals whose last meal was that of the previ-

ous evening. The residuum was then removed and the material under investigation was introduced into the stomach. Samples of 5 ccm. of gastric contents were then removed for study at intervals of ten minutes. This was continued until the stomach was empty. The presence of trypsin and hile was used in determining whether regurgitation of duodenal contents had occurred. The authors found that trypsin is almost constantly demonstrable in the fasting and digesting contents of the normal human stomach. They found normal individuals of the high acidity type usually yielded low trypsin values while in those of low acidity type tryptic power was marked. The latter fact suggested to the authors the possibility of tryptic digestion occurring in part in the stomach as a compensatory action in cases of low acid and pepsin secretion. They found that the introduction of 0.5 per cent hydrochloric acid into the stomach is followed by a rapid reduction of acidity to about 0.2 per cent hydrochloric acid or less. The fall in acidity is accompanied by a rise in tryptic values and by the presence of hile. The author's observations of the action of hydrochloric acid and pepsin upon trypsin are not without interest. Most of their experiments were done with freshly removed samples but they have found trypsin present in samples having an acidity of 1.10 ccm.

$\frac{1}{10}$ KOH which had stood for eighteen hours at room temperature. Other tests have shown that trypsin seems but little influenced by the acid and pepsin in the gastric contents. After introduction into the stomach of 5 per cent sodium bicarbonate solution it was found that if a prompt secretion of gastric juice failed, the solutions were held in the stomach for some time and acquired high tryptic values and also underwent marked color changes. The retention appeared to be for the purpose of reducing the alkalinity in order to render the fluid harmless to the duodenum. With weaker solutions of alkali the secretion of acid by the stomach and neutralization were more prompt. Furthermore fluid escaped from the stomach into the duodenum before the contents had become acid, thus indicating that acidity of the stomach contents is unnecessary for the opening of the pylorus in man though Cannon has shown that it is in cats. The authors incline to the view that the human pylorus is controlled from the duodenum acid fluid keeping the pylorus closed until the fluid in the duodenum is neutralized. In the human stomach too the authors find that weak sodium bicarbonate solutions have a

stimulating effect on gastric secretion and at the same time hasten the emptying of the stomach.

STUDY OF PANCREATIC FUNCTION

In an excellent review of the subject Sladden discusses twenty of the more important methods for pancreatic examination and he divides these tests into two groups.

1 Tests of external secretion dependent upon abnormalities in the ferments of the pancreatic juice

2 Tests dependent upon other function of the pancreas

In this review attention will be especially devoted to the following tests which in the author's experience have yielded significant results

1 Analysis of duodenal contents

2 Analysis of faeces for pancreatic enzymes

3 Analysis of blood and urine for diastase.

4. Chemical examination of faeces following a Schmidt Strausburger test diet

ANALYSIS OF DUODENAL CONTENTS REMOVED BY EINHORN DUODENAL TUBE

To obtain pancreatic secretion the Einhorn duodenal pump is used. This ingenious instrument was devised and perfected by Einhorn and has been used by him in many cases for collecting the duodenal contents. It consists of a vulcanized rubber catheter (one meter long) of narrow bore to one end of which is attached a small perforated metallic capsule and to the other end an aspirating glass syringe. The patient is allowed to swallow the capsule and attached catheter (up to 80 centimeters) at eight o'clock at night deglutition being assisted by the drinking of a little water. At midnight eight ounces of milk are drunk for the purpose of assuaging the capsule to pass the pylorus during sleep. At 6.30 a.m. the same amount of milk is again administered. This latter milk serves as a test meal. Two and a half hours later the contents of the duodenum are aspirated. The catheter is slightly withdrawn until the point marked 80 centimeters is opposite the incisor teeth. At this point it is estimated that the capsule lies in the first part for the duodenum and opposite the points of exit of the pancreatic duct. Aspiration of the contents of the intestine is practiced for five minutes, the volume and character of the resultant fluid being noted.

The contents withdrawn are assumed to be duodenal contents if (1) a radiograph shows the tube *in situ* in the duodenum or (2) if upon slowly withdrawing the tube, while aspirating, a distinct

difference is noted between the contents obtained at the point marked 80 centimeters and the contents withdrawn after the metallic capsule is felt suddenly to enter the larger cavity of the stomach—56 centimeters. When the capsule lies in the duodenum one obtains in the course of five minutes 10 to 40 cubic centimeters of golden yellow slightly acid or neutral rather viscid fluid, with a more or less opalescent hue. This material can be aspirated only slowly. At first the contents present in the duodenum 10 to 20 cubic centimeters flow easily then under continued negative pressure one obtains slowly as it is secreted, a few cubic centimeters more of clearer golden yellow fluid. This material enters the aspirating syringe drop by drop or rhythmically every 20 to 30 seconds, with a rapid gush of 1 to 2 cubic centimeters of material. This latter phenomenon is probably due to a peristaltic acceleration of the secretions entering the duodenum at the moment and to the periodic expulsion of gastric juice (Crohn).

The duodenal contents are then analyzed by the process followed by Crohn.

Amylase. In every one of several test tubes is placed 1 ccm. of the fluid to be tested. Increasing amounts from 0.5 ccm. to 6 ccm. of 1 per cent starch solution (Kahlbaum's soluble starch) are added to the successive test tubes, and then water to bring the volume up to 10 ccm. Incubation proceeds at 40° C. for one hour. The material is then tested by adding Lugol's solution drop by drop until an excess of iodine is apparent. The last tube in the series which fails to react for starch is the tube from which the reading is taken. The number of cubic centimeters of starch solution in this test tube multiplied by the dilution (three) gives the factor accepted as representing the amylolytic activity of 1 ccm. of duodenal contents in one hour.

Lipase. To 10 ccm. of distilled water are added 1 ccm. of the diluted duodenal juice 1 ccm. of ethyl butyrate 1 ccm. of toluol and a drop of 1 per cent alcohol phenolphthalein solution. The whole is then made exactly neutral with $\frac{n}{10}$ NaOH and the total amount of fluid brought up to 25 ccm. The flask is shaken forcefully for fifteen seconds and again brought to the exact neutral point.

A control test is always prepared the duodenal juice of the control being boiled actively for five minutes before being placed in the flask.

After incubation for twenty four hours at 40° C. the two flasks are titrated for free acid, and the

amount necessary to bring the control to neutral subtracted from the free acid in the test flask. The result multiplied by three (the dilution of the duodenal juice) denotes the lipolytic strength of the test material.

Protease To test for alkali protease Mett tubes coagulated egg-albumen cubes Fermi gelatin tubes (5 per cent and 10 per cent) and casein (Gross-Fuld method, as suggested by them for use in stool tests) are utilized.

The Gross-Fuld method is based upon the principle that faintly alkaline solutions of casein are precipitated upon the addition of dilute (1 per cent) acetic acid whereas its digestion products are not so precipitated. The method is carried out as follows. Prepare a series of tubes each containing 10 ccm of a 0.1 per cent solution of pure fat free casein which has been heated to a temperature of 40 C. Add to the contents of the series of tubes increasing amounts of trypsin solution under examination and place them at 40 C for fifteen minutes. At the end of this time remove the tubes and acidify the contents of each with a few drops of dilute (1 per cent) acetic acid. The tubes in which the casein is completely digested will remain clear when acidified while those tubes which contain undigested casein will become more or less turbid under these conditions. Select the first tube in the series which exhibits no turbidity upon acidification thus indicating complete digestion of the casein to calculate the tryptic activity of the enzyme solution under examination.

Calculation The unit of tryptic activity is an expression of the power of 1 ccm of the fluid under examination exerted for a period of fifteen minutes on 10 ccm of a 0.1 per cent casein solution. For example if 0.5 ccm of a trypsin solution completely digests 10 ccm of a 0.1 per cent solution of casein in fifteen minutes the activity of that solution would be expressed as follows

Tryptic activity = $1 \div 0.5 = 2$

Such a trypsin solution would be said to possess an activity of 2. If 0.3 ccm of the trypsin solution had been required the solution would be said to possess an activity of 3.3 i.e. $1 \div 0.3 = 3.3$ (Hawk)

Crohn drew the following conclusions from his study

The quantitative examination of duodenal ferments is the most rational and accurate method of studying the external secretion of the pancreas. Diminution of such enzyme activity of the pancreas is a reliable sign of organic disease of the gland. Occasionally though rarely a diminution of ferments occurs as a symptom of advanced

organic disease elsewhere in the body. Roughly the diminution of ferments is directly proportional to the extent of organic destruction which has taken place.

The absorption of fat and nitrogen from the intestine is independent of the condition of the external secretion or even of its presence. Absorption may be poor with an intact gland or good with a gland of which only a fragment survives the disease. The functional activity of the gland not its organic condition determines the degree of absorption. This is probably controlled by an internal secretion or hormone.

Duodenal ferment tests give the index of the organic condition of the gland. Absorption tests give the index of the functional activity of the pancreas.

Frank succeeded in obtaining duodenal contents in 60 per cent of the cases he attempted. The cases were chosen at random and suffered no pancreatic disease. The duodenal contents in all these instances showed active alkali protease where tested for. The other ferments were not investigated. The inability of Frank to obtain the duodenal material desired in 40 per cent of his attempts is probably due to too short a time being allowed for the metallic capsule to enter the duodenum. This was obviated in Crohn's series of cases by passing the pump in the evening and allowing the entire night to elapse before aspirating the desired material. Even then more than one attempt is sometimes required before success is attained. The procedure is a mild one and only exceptionally objectionable to the patient.

White used the tube in 90 cases. 56 for diagnosis in 34 for treatment. The tube reached the duodenum in about 30 per cent of the cases with in fifteen minutes in about 30 per cent more within a half hour and in about 20 per cent more of the cases within one to six hours. In about 20 per cent of the patients the tube had to be left in over night in order to reach the duodenum. Some difficulties were met in adapting the routine to different sizes of patients and different sizes and shapes of stomachs. The quickest way to enter the duodenum White found was to get the tube close to the pylorus within a short time. This is best accomplished by using a light tube with a heavy tip swallowed by the fasting patient in the erect position feeding the tube in slowly and steadily.

Finhorn reports his study of the pancreatic secretion by means of the duodenal tube.

In order to ascertain the condition of the duodenal contents in health several apparently perfectly healthy persons were examined with

regard to the state of their pancreatic secretion. They took the duodenal tube either at night before retiring or between 4 and 5 a.m. with a glassful of water. They then slept, rose at 8 a.m. and the duodenal contents were then removed. The amount of ferments in normal individuals fluctuated as follows: amylase 4 to 8 mm. steapsin 2 to 5 mm. trypsin 0.5 to 5 mm. The average figures were: amylase 6 mm. steapsin 3.5 mm. trypsin 2.9 mm. The alkalinity as determined by one tenth standard solution of hydrochloric acid with methylorange as an indicator varied between 15 to 40. The rennet ferment was present in all.

Einhorn has examined 170 patients with regard to their duodenal contents making about 275 analyses of the pancreatic secretion. The examination took place either in the fasting condition of the patient or after tea and sugar or clear bouillon ordinarily about one to one and a half hours after the ingestion of the latter into the stomach. The duodenal tube was introduced either the night previous or two or three hours preceding the examination. The contents were obtained first by aspiration then by siphonage. The quantitative examination of the amounts of the different ferments was determined by agar tubes. The alkalinity was determined in 57 patients and averaged 22. Ordinarily it fluctuated between 20 and 30. As far as can be seen there is no relation between gastric acidity and pancreatic alkalinity. In looking over the results obtained by these examinations there exists a noticeable independence between the three different ferments with regard to quantity in the same individual—one ferment may be present in large amounts while the other two may be present in small amounts or may be absent. The quantity of one ferment is no indication as to the amount of the other two ferments. It is thus necessary for us to test for each of the three ferments separately. This is accomplished in the most convenient way by means of agar tubes. The pancreatic secretion is subject—similar to the gastric juice—to functional anomalies or deviations from the normal. The juice may contain an overabundance of ferments or too small an amount of them. Again there may be hypersecretion or greatly diminished secretion. While in the gastric juice the functional activity is generally reckoned by the amount of hydrochloric acid present there has as yet been no definite substance of the pancreatic secretion selected for this purpose. The trypsin ferment being the most important ingredient of the pancreatic juice the author suggests its use as a

gauge for the functional activity of this gland. The following terms may be advantageously used: eupancreatism—normal function all three ferments present trypsin showing the normal quantity (1 to 4 mm.). Hyperpancreatism—increased activity all three ferments present, trypsin existing in excess (above 4.0 mm.). Hypopancreatism—diminished activity—the three ferments present trypsin decreased (below 1 mm.). Dyspancreatism—disturbed function one or two of the three ferments are absent. Heteropancreatism—varied function the presence and amount of ferments showing no constancy but variations every now and then.

Landau and Rensnickl recommended that the duodenal contents be examined for the three enzymes the results they obtained were very favorable.

According to Chase and Myers active amylolytic, lipolytic, and proteolytic enzymes are present in duodenal juice, though the activity of these enzymes is apparently subject to considerable variation under normal conditions. The acidity of the gastric juice appears to be without influence on the activity of the enzymes present in the duodenal juice. In a case of carcinoma of the gall-ducts and pylorus with biliary obstruction there was an entire absence of bile from the duodenal juice. In a case of chronic pancreatitis the amylolytic and proteolytic activity was entirely negative while the lipolytic activity was comparatively weak. The absence of pancreatic enzymes from the duodenal juice would appear to be positive evidence of either pancreatitis or non-patency of the pancreatic ducts while the lack of bile would appear to afford similar evidence of the occlusion of the common bile-duct.

In my experience the examination of duodenal contents for pancreatic enzymes has yielded very valuable information. The test fluid can be easily obtained and the analytical methods are extremely simple, so that clinicians should devote more attention to this source of information regarding pancreatic function and the condition of the duodenal contents.

It must be remembered however that the ptyalin of the saliva may yield results simulating amylase that the pepsin of the stomach and erepsin of the intestines may hide the absence of trypsin and that gastric lipase may be present and disguise the absence of pancreatic steapsin. If proper precautions are taken, however these difficulties may be overcome.

Analysis of the feces for pancreatic enzymes. *Trypsin.* The fact that the feces normally contain traces of a proteolytic ferment was shown by

Leo Baginsky Schmidt, and others while Hemmeyer proved that it was trypsin, and not pepsin, since it digests fibrin in an alkaline, or neutral but not in an acid medium. The experiments of Frank and Schuttenhelm with faecal extracts passed through a porcelain filter have shown that the proteolytic action of the faeces is not dependent upon the presence of bacteria. The earlier experiments were carried out with fibrin or Mett's tubes filled with white of egg or blood serum and it was not until Muller showed that drops of the fluid faeces obtained by the administration of a purgative such as calomel or purgen or an emulsion of a formed stool with glycerine, placed on a serum plate containing dextrose broth (Loeffler) and incubated at 50 to 60 C gave, under normal conditions, pits due to the digestion of the solid serum, that the examination of the stools for trypsin as a diagnostic measure began to attract much attention. If the pancreas is functioning normally evidences of digestive changes in the serum plate should be obvious in about half an hour. If no change has taken place in twenty four hours it may be concluded that there is pancreatic insufficiency. This method has, however inherent difficulties which militate against its general use, and the test devised by Gross, or one of its modifications, is now more frequently employed.

While some observers have failed to find trypsin in meconium by these methods others state that it is usually present. There can be no doubt however that it quickly makes its appearance and may usually be detected within a short time after birth. In normal persons the tryptic activity of the faeces is uninfluenced by the diet, or a diminution of the acidity of the gastric juice by the administration of large doses of bicarbonate of soda (Schlecht). It is increased in diarrhoea and conditions which stimulate peristalsis thus hindering the absorption and destruction of the ferment. Constipation on the other hand diminishes the quantity of trypsin in the stools. Schlecht states that he obtained only a feeble reaction in several cases of carcinoma of the stomach in which there was no mechanical obstruction of the pancreatic ducts, and explains this result by suggesting that a diminished activity of the pancreas was produced by the gastric disease or by the associated cachexia. In a case of poisoning by corrosive sublimate with markedly bloody stools no proteolytic action could be obtained with the faeces owing to the antiferment present in the blood serum. In Cammidge's experience and that of most other observers a negative result is most constantly obtained in

cases of cancer of the head of the pancreas and it is therefore an exceedingly useful test in the diagnosis of that disease. Cirrhosis of the pancreas and obstruction of the duct by gall stones, etc. interfere more or less with the digestion of proteins by extracts of the faeces but rarely give rise to such very striking results as are seen in cases of growth in the head of the pancreas.

Crohn thus discusses the identity of the proteolytic ferments of the duodenal contents and of the stool.

To return to a consideration of the alkali protease found in duodenal content, one must consider that we are dealing with two ferments, trypsin and erepsin. Erepsin originates from two sources the duodenal mucosa (Cohnheim) and from the pancreas (Bayliss and Starling). Schaeffer and Terrone experimenting with the excretion of an artificial pancreatic fistula in the dog showed that in fluid in which trypsinogen was present but not activated by enterokinase an ereptic ferment with peptone splitting properties was still present. Of the test for alkali protease neither the Mett tubes nor the coagulated egg albumen cubes are attacked by erepsin nor are the Fermi gelatin tubes digested by erepsin. To establish this latter point three fresh extracts of duodenal mucous membranes containing active erepsin (one cat one dog and one human intestine) were prepared after the method of Cohnheim. None of these extracts liquefied gelatin even after three days.

These same extracts in their most concentrated form were tested for the casein digesting power of the intestinal mucosa. That the digestive power of these intestinal extracts is only a very slight fraction of the same power of the pancreatic secretion is seen by a comparison of the results obtained. Thus cat mucosa extract in dilution of 1 to 15 dog mucosa extract 1 to 140 human mucosa extract 1 to 10 digested 10 ccm. of 0.1 per cent casein solution normal human duodenal contents containing pancreatic secretion digests the same amount of casein in dilution up to 1 to 10,000. It seems fair therefore to deduce that the amount of erepsin present both in the mucous membrane of the duodenum and in the pancreatic secretion could not account for the active proteolysis of casein as found in duodenal contents. Hence, we seem justified in assuming that the pancreatic trypsin is the active factor here and erepsin, while unquestionably present yet is of little moment in the tests as carried out.

A similar process of reasoning seems justified in discussing the results of the stool examinations

for if the concentrated extract of normal duodenal mucosa digests casein in dilution of only 1 to 10 how can we explain the proteolysis of casein in dilutions of the stool up to 1 to 10,000 or 1 to 20,000 as frequently found except on the hypothesis that it is the much more powerful pancreatic trypsin that is appearing in the stool?

Frank and Schuttenhelm by means of complicated polypeptide splitting experiments seem to demonstrate that the protease present in the stool is erepsin rather than trypsin. It is difficult to harmonize their findings with such simple facts as the above. The occasional finding of a ferment in the stool which liquefies gelatin would tend to confirm the impression that this ferment derives its origin from the pancreas. That bacteria do not simulate the results of the human ferments seems established by the fact that a case in which the pancreatic ducts have been proved to be closed gave complete negative results in both duodenal and stool analyses.

Demonstration of trypsin in the stools. The serum plate method. Mulker and Schlect found that trypsin would act upon the surface of a serum agar plate producing small depressions. They demonstrated by this method the regular occurrence of trypsin in normal faeces. The plates were kept at a temperature of 50 or 60 C. so that bacterial action was prevented. In several cases of primary and secondary disease of the pancreas trypsin was absent from the faeces or greatly diminished. A number of investigators have found this method of value. It yielded positive results in five out of six cases of pancreatic disease examined by M. Hirschberg.

The casein method. Casein in alkaline solution is precipitated by acidifying with dilute acetic acid. When the casein is digested by trypsin the addition of acetic acid produces no clouding of the solution. This is the basis of a method introduced by Gross for detecting the presence of trypsin. More than 200 stools were examined by him, and in all cases in which disease of the pancreas could be excluded a protein-splitting ferment was present in the faeces. Brugsch and Masuda have concluded from their investigations that the strong splitting of casein produced by faecal extracts cannot be attributed to erepsin. Spooner and Pratt in a recent case of cancer of the pancreas found that the power of the faeces to digest casein was entirely lost. In a case of fatty diarrhoea, probably due to pancreatic hypochylia, the amount of trypsin in the faeces was greatly reduced. In this case the cell nuclei were not digested in Schmidt beef-cubes, and after administration of Sahli's glutoid capsules

no reaction was obtained in the urine even at the end of twenty-four hours.

Gray and Pickman studied pancreatic ferments in cases of pulmonary tuberculosis. Trypsin and amylase were determined in the stools in a series of nearly one hundred cases of tuberculosis and it was found that the pancreatic secretion was seriously reduced by the toxins of tuberculosis. Rest either in bed, or by means of pneumothorax reduced the formation of toxins and permitted the pancreatic ferments to return toward normal. Persistently low trypsin index was found to be of bad prognostic significance, but low amylase readings were less unfavorable. The interpretation of the index must always take into consideration anorexia, overeating, and diarrhoea.

Amylase (diastase). The presence of diastase is shown by the digestive action that it has upon starch using a solution of iodine as the indicator.

The following is Robert and Strasburger's method as modified by Gonfion and Tallarico. A 1 per cent solution of starch is mixed with an equal part of 10 per cent solution of the faeces in thymol water neutralized and filtered. The filtrate is placed in the incubator at 37 C. and at regular intervals a drop is brought in contact with a drop of iodine solution. When it ceases to give a blue color the digestion of the starch is considered to be complete. The stool should be fresh and there should not be the slightest admixture of urine. It is often sufficient merely to mix the stool and the starch solution in a test tube held in a water bath and apply the iodine test. If an abundance of amylase is present the starch will be digested in about five minutes.

Wohlgemuth has adopted the following quantitative method for determining the diastase in the stools. The fresh faeces are well fixed and 5 grams are thoroughly ground in a mortar with 20 ccm. of 1 per cent solution of sodium chloride added a small quantity at a time. The emulsion is then left for half an hour at room temperature, stirring it frequently meanwhile. It is then divided equally into two portions of 10 ccm. each and is transferred to graduated centrifuge tubes, which are centrifuged until all the solid material is collected at the bottom and stands at the same height in both tubes. The quantities of sediment and supernatant fluid are noted. Nine test tubes are then taken. Into the first three 1.0 ccm. 0.5 ccm. 0.25 ccm. of the undiluted extract. Into the next three 1.0 ccm., 0.5 ccm. 0.25 ccm. of an eightfold dilution of the original extract, made with 1 per cent sodium chloride and in the last three, 1.0 ccm. 0.5 ccm.

0.25 ccm. of a sixty four fold dilution are placed so that each tube contains half the fecal extract of the preceding

| | | | | |
|----------|----------|-------|----------|-------|
| 1st tube | 4th tube | 5 | 7th tube | 95 |
| 2nd tube | 5 | 0.625 | 8th tube | 0.078 |
| 3rd tube | 5 | 31 | 9th tube | 0.039 |

To each tube 5 ccm. of a 1 per cent solution of starch are added. The tubes are then plugged with wool, or closed with corks and placed in the incubator at 38° C. for twenty four hours. At the end of that time they are filled to within a finger breadth of the brim with cold distilled water, one drop of a decinormal iodine solution is added to each, and the lowest dilution giving a blue reaction looked for. It is then assumed that the tube next lowest in order contains sufficient diastase to convert all the added starch and from this the quantity of 1 per cent starch solution fermented by 1 ccm. of the fecal extract can be calculated. Knowing the proportion of solid residue liquid extract in the 5 grams of feces the quantity of ferment corresponding to 1 ccm. of this residue can be determined and from this the diastatic power of the total daily mass of feces can be determined. According to Wohlgemuth and Wynhausen the average diastatic value of the feces lies between 470 and 500. To obtain satisfactory results the feces must be homogeneous and alkaline in reaction as diastase does not act in an acid medium. It is advisable to place the patient on a simple mixed diet, calculated to stimulate the functions of the pancreas to normal activity for a couple of days before the feces are collected for examination.

Amylase was first demonstrated in the feces of infants by Wegscheider. Later von Jaksch, Maro Allaire and others showed that the feces of children constantly contain it. It is found during the first week of life in abundance and Pottevin proved that it is constantly present in meconium. The quantity appears to diminish somewhat in later life but according to Strassburger it never entirely disappears. It has been suggested that the diastatic action of fecal extracts on starch might be due to the contained bacteria but the experiments of Kerley, Mason and Craig have proved that an extract freed from bacteria by filtration through a Berkefeld filter has an unchanged action on starch. The amount present in the stools appears to vary within very wide limits normally perhaps as a result of changes in the diet. Diarrhoea increases the quantity and constipation generally diminishes it. In diseases of the pancreas interfering with the flow of pancreatic juice into the intestine the digestive action of an extract of the feces for

starch is diminished or may be altogether abolished thus in many cases of cancer of the head of the pancreas Cammidge has obtained an unchanged blue reaction with iodine after twelve or even twenty four hours incubation but with growths of the gall bladder and common duct that did not obstruct the pancreatic duct, starch digestion has not been interfered with.

From Brown's study on the diastase content of feces in normal and in certain pathologic conditions the following conclusions are drawn. The stool if a rigorously exact method is carried out as to food purgative employed preservation of specimen estimation of ferment etc. furnishes a diastase content within definite limits. The effect of waiting too long after the stool has been obtained before making the examination the influence of variations in temperature in the place in which it is kept and of different laxatives and different foods is so great as to render results obtained by methods in which insistence on such a rigorous technique has not been made of much less value.

Extensive carcinoma of the pancreas showed no diastase in the tube of lowest dilution in Brown's method and this absence of ferment should prove of great help in the diagnosis of this condition. In chronic pancreatitis diastase was present in the stool, but in markedly diminished amounts. In achylia gastrica the diastase content of the stool was practically normal in all the cases examined. This in the first place, suggests that in the absence of hydrochloric acid some other method of pancreas activation is called into play and, in the second place that the diarrhoea met with in certain of these cases of achylia gastrica—the so-called gastrogenous diarrhoea—is not of pancreatic origin.

Gerganoff points out the possibility of error in the quantitative determination of enzymes in the feces through the admixture of blood. Blood, whether it be from the stomach or intestines, may lead to considerable increase of the fecal ferments. (Gerganoff studied diastase particularly.) Especially intestinal hemorrhages when large produce a decided increase. But gastric hemorrhages when hydrochloric acid is lacking may lead to similar results. When free hydrochloric acid is present in the stomach it may be concluded with reserve that a bloody stool rich in diastase is not due to gastric hemorrhage but to bleeding from the duodenum or lower portions of the intestine. This point may prove useful in the diagnosis of a gastric ulcer or in its exclusion.

The quantitative examination of stool and duodenal ferments according to Crohn is the

most rational and accurate method of studying the external secretion of the pancreas. Diminution of such enzyme activity of the pancreas is a reliable sign of organic disease of the gland. Occasionally though rarely a diminution of ferments occurs as a symptom of advanced organic disease elsewhere in the body. Roughly the diminution of ferments is directly proportional to the extent of organic destruction which has taken place. The absorption of fat and nitrogen from the intestine Crohn says is independent of the condition of the external secretion or even of its presence. Absorption may be poor with an intact gland, or good with a gland of which only a fragment survives the disease. The functional activity of the gland not its organic condition determines the degree of absorption this is probably controlled by an internal secretion or hormone. Duodenal ferment tests give the index of the organic condition of the gland. Absorption tests give the index of the functional activity of the pancreas.

According to Schleicher the value of the various methods of testing the external secretion of the pancreas is still *sub judice*. In order to determine the reliability of the various tests the author has employed the most popular methods in 22 instances in which external pancreatic secretion seemed to be abnormal. The methods of Gross and Muller for the detection of trypsin and the diastase test of Wohlgemuth are reliable the nuclein test of Schmidt is less trustworthy. A definite opinion concerning the methods of Wintermats and Ehrmann cannot as yet be given. The oil-breakfast of Boldireff Volhard furnishes reliable results. On the other hand the gelodurate test of Schlecht and the glutoid capsules of Sahli give less reliable results. The methods of Gross and Wohlgemuth may be recommended for acute cases here the qualitative and quantitative demonstration of trypsin and diastase in the feces as well as in the urine must be made. Both tests are very reliable they alone will evince the degree of functional pancreatic activity. Other tests may be employed to corroborate the findings obtained with these methods.

Lipase in the stools has little significance so far as pancreatic disease is concerned. In 1875 Pfeiffer showed that the feces contain a fat splitting ferment. It is not derived from the pancreas but appears to come from the intestinal mucous membrane although a bacterial origin cannot be altogether excluded. Hecht has proved that the stools of infants contain a ferment which has the power of splitting the fats contained in the yolk of eggs by the Volhard Stadel method.

The yolks of three eggs are emulsified with 100 ccm. of water. Ten ccm. of this are mixed with the specimen to be tested, and the mixture is placed in the incubator for two to three hours. It is then well shaken with 75 ccm. of ether and left to stand the separation of the ether being promoted by the addition of a few cubic centimeters of neutral alcohol. With a pipette 50 ccm. of the ether are removed and mixed with 75 ccm. of neutral alcohol and titrated with decinormal soda. The mixture is then placed in a flask 10 ccm. of normal soda solution are added, the flask is well corked and left at room temperature for twenty four hours. Ten ccm. of normal hydrochloric acid are now added, and the mixture is again titrated with decinormal soda. In both titrations phenolphthalein is used as the indicator. The result of the first titration gives the fatty acids and the second the soaps that have been formed. From these the amount of fat that has undergone saponification can be reckoned.

Another method is to incubate a mixture of fluid to be tested with ethyl butyrate for a few hours. If the mixture has been previously rendered neutral the presence of butyric acid can be recognized by its action on neutral litmus, or it may be titrated with decinormal soda and phenolphthalein.

According to Hemmeter the fat-splitting ferment contained in an extract of feces does not act upon olive oil. Hecht could not find any parallelism between the quantity of lipase in the stools and the amount of neutral fat, fatty acids, and soaps in the feces.

Trypsin in the urine. Wohlgemuth has shown that laceration of the dog's pancreas gives rise to a rapid and marked increase in the quantity of diastase in both blood and urine. The method he employed required twenty four hours for its completion which is a great disadvantage in the study of human cases, and he has therefore, so modified it that the result may be obtained in one half hour. Using this method with normal human sera (150 cases) Wohlgemuth and Noguchi found the normal value to be 8 to 16 the highest normal value found was 32. Thus, if a lesion of the pancreas is suspected in a patient who has received a severe blow on the abdomen a value of 64 greatly strengthens the supposition.

Marino reports a quantitative study of urinary diastase in various diseases. He used the method of Wohlgemuth. The author finds (1) that the excretion of diastase in the urine is greatly lessened in nephritis and in diabetes mellitus. (2) In pancreatic disease the urinary diastase is increased in quantity. This the author believes,

is a very important sign of pancreatic disease (3) As a functional test of the kidney the quantitative estimation of diastase is valuable. (4) In pernicious anemia and in secondary anemia the diastase of the urine is markedly decreased. The diminution seems to be greater in pernicious than in secondary anemia though the number of cases studied is too small to formulate a rule.

In making determinations of the diastatic ferments in the urine according to Wohlgemuth's method Neumann calls attention to the fact that reliable estimations should be based upon the twenty four hour output. The total diastatic ferment amount per diem varies much with the same individual and appears to be influenced more by psychic factors than by changes in the diet. Generally the diastatic power of the blood serum is less than that of the urine. This is found to be definitely decreased in diabetes mellitus the amount of reduction being of some prognostic value. It is also diminished in pernicious anemia, Basedow's disease and in some forms of nephritis. The notable increase in pancreatic disease is of real diagnostic worth. There is a slight increase in urinary diastase in some febrile conditions. Investigations carried out in a number of other diseases showed no great deviation from the normal.

The work of Wohlgemuth has been confirmed by Corbett Yvon Noguchi and others. Hirschberg found a large amount of diastase in the urine of two cases of pancreatitis and Wynhausen in two cases of cancer of the pancreas.

In my experience, the determination of amylase in the urine by the method of Wohlgemuth throws much light on the condition of the pancreas. In obstruction of the duct of Wirsung either by cancer gall stone enlarged glands etc. the amylase of the urine is much increased in output. In organic disease of the pancreas a similar state of affairs exists.

I wish to say a few words regarding the Cammidge test.

The reaction of Cammidge about which so much has lately been written does not seem to be so successful in the hands of others as in those of the author. Cammidge says. My experience with the improved method has been most satisfactory for in every case where pancreatitis has been found to be present the urine has given more or less marked reaction corresponding to the extent of the lesions. Normal urines have given no reaction and control cases where there was no pancreatic lesion have also proved negative.

In careful studies recently reported by Wilson

Kenney Whipple and others little value is accorded the test. Wilson reporting on 504 tests from the Mayo Clinic says. The end results judged by Cammidge's own criteria must be considered as a means of diagnosing disease of the pancreas as both valueless and misleading. There is no apparent clinical relationship between disease of the pancreas and any of our various types of end reaction.

Kenney, reporting from Deaver's service in the German Hospital Philadelphia, says. Very little dependence can be put upon a negative reaction and a positive reaction can only be considered of value as a confirmatory examination.

In my experience the reaction of Cammidge is of no value as an aid to diagnosis of structural or obstructive disease of the pancreas.

Chemical analyses of the feces following the Schmidt-Strassburger diet. The diet consists of 1 5 liters milk, 100 grams zwieback 2 eggs 50 grams butter 125 grams beef 190 grams potatoes and gruel of 80 grams oatmeal. It contains about 102 grams albumin 111 grams fat 191 grams carbohydrates or a total of 234 calories.

In the morning 0.5 liter milk (or if milk does not agree 0.5 liter cocoa prepared from 20 grams cocoa powder 10 grams sugar 400 grams water and 100 grams milk) and 50 grams zwieback.

In the forenoon 0.5 liter oatmeal gruel (made from 40 grams oatmeal 10 grams butter 200 ccm. milk, 300 ccm water 1 egg strained).

At noon 125 grams chopped beef (raw weight) broiled rare with 20 grams of butter so that the interior will still remain raw and 250 grams potato broth (made of 190 grams mashed potatoes 100 ccm milk and 10 grams butter).

In the afternoon As in the morning.

In the evening As in the forenoon.

In the recognition of severe pancreatic disease there is no single symptom of greater significance than bulkiness of the stools. This is a diagnostic sign to which Oser Musser and others have called attention. Much information can often be gained from the weight of dried stools and this can be ascertained even when facilities are not available for exact chemical analyses. All that is necessary in addition to scales for weighing is a water bath and a ventilating hood. With pancreatic juice absent from the intestine, not only are the stools voluminous but the dried residue is much in excess of the normal.

In a series of six healthy individuals placed on the test diet for three days Schmidt found the average weight of the dried feces to be 54.3 grams. The maximum was 62 grams and the

minimum 45 grams. Pratt found in a case of obstructive jaundice associated with malignant disease of the pancreas that the weight of the dried faeces was 417 grams in one metabolism period of three days and 355 grams in another. In a patient with chronic fatty diarrhoea and glycosuria without icterus the faeces weighed 438 grams.

The increase in weight of the faeces which results from shutting off the pancreatic juice from the intestine was well shown in animal experiments by Cammidge. In a preliminary absorption test with the dog in normal condition the weight of the dried food in a period of three days was 624 grams and the weight of the faeces 140.4 grams. In a metabolism experiment of the same duration begun five days after separating the pancreas from the duodenum the weight of the dried food was reduced to 416 grams and that of the faeces increased to 302.7 grams.

In none of the cases studied by Schmidt was such a marked increase in weight of the faeces observed as in Cammidge's 2 cases of pancreatic disease. The average weight of the faeces in 5 cases of fermentative dyspepsia reported by him was 127.4 grams; the average in "gastrogenous diarrhoea" with achylia was 98.9 grams. His highest figures were in obstruction of the common bile-duct where the average weight was 175.6 grams, and the maximum 215.4 gram. There are no observations on cases of obstruction of the pancreatic ducts given by Schmidt. It seemed to Cammidge that the possibility of shutting off the pancreatic secretion by an obstruction in the lower part of the common bile-duct should be recognized. This may be the explanation of the heavy weight of the faeces in 2 of his cases.

In a number of cases of pancreatic disease metabolism studies have shown a great interference with the absorption of fat and nitrogen. Morrison and Pratt made a metabolism experiment on a patient presenting the typical symptoms of total obstruction of the pancreatic ducts. There was no jaundice. It was found that 58.9 per cent of the fat of the food was excreted in the faeces. The percentage of nitrogen unabsorbed was 50.9 per cent. Normally not over 5 or 10 per cent of the fat or nitrogen of the food is lost in the faeces.

In a metabolism experiment on a patient with cancer of the pancreas and obstructive jaundice, Spooner and Pratt found that 79.9 per cent of the fat of the food was excreted in the faeces and 34.8 per cent of the nitrogen.

Harley reported a case of probable obstruction

of the pancreatic ducts without jaundice, in which there was a fat loss of 73.1 per cent. In a case of cirrhosis and atrophy of the pancreas, combined with cirrhosis of the liver Weintraub found a fat loss of 25.2 per cent. Deucher in cancer of the pancreas found fat losses of 82.9 per cent and 52.6 per cent. Brugsch and König, in a case of abscess of the pancreas, 59.7 per cent (abnormal in experiment of only one day's duration). Blassner and Siegel in a case of atrophy of the pancreas due to a calculus found a fat loss of 50.1 per cent. Gigon in a case of pancreatic calculus with obstruction of the ducts, a maximum fat loss of 47.4 per cent and a minimum of 13.5 per cent. Ehrmann in atrophy of the pancreas 50.2 per cent. Tileston in 5 cases of cancer of the pancreas with icterus fat losses of 15.6 per cent, 68 per cent, 52.6 per cent, 45.6 per cent, 49.1 per cent.

In Harley's case there was a nitrogen loss of 40 per cent. Weintraub found a nitrogen loss of 60.6 per cent. Deucher 20.6 per cent in one case and 19 per cent in the other. Blassner and Siegel 41.5 per cent. Gigon 24.7 per cent and Ehrmann 42.8 per cent. Tileston in three cases, 19.8 per cent, 14.5 per cent and 21.1 per cent. Brugsch found an average fat loss of 45 per cent in three cases of icterus but the nitrogen loss averaged only 11 per cent. If 50 per cent or more of the fat and 25 per cent of the nitrogen of the food are recovered from the faeces the conclusion is warranted that pancreatic insufficiency exists.

While the method of chemical analysis of the faeces is more difficult than the other tests, it yields results which are of greater value. Of course these examinations can be carried out only in a well equipped laboratory and better still in a hospital laboratory.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Lambert F B : *Massage and Medical Electricity in the After Treatment of Convalescent Soldiers*; Account of the Mechano- and Electro-therapeutical Department at the Command Depots and Convalescent Camps. *Lancet* Lond. 1916 cxd, 788.

Many soldiers who are unfit because of stiff joints, trench feet, nerve injuries sciatica, and similar affections are given electric and massage treatments at various established convalescent hospital camps in England. The patients comprise those who after being cared for in the general hospitals, still have affections which render them unfit. The treatment consists in electrotherapy with galvanic, faradic, and combined currents local radiant heat, vibrators, massage mechanical exercise re-education of movement and lectures on hygiene. The men receive a final training of short marching and general physical exercise for six weeks before being returned to their units. The masseuses are all trained in their work, the standard being at least six months training and about 90 per cent have certificates from the Society of Trained Masseuses. This is quite different from the practice in France, where most of the workers are untrained. At the large camps, among which are Eastbourne and Epsom, from 600 to 800 patients are treated daily. The work is reviewed periodically by an inspector of orthopedics. The average time a patient stays at such camps is two and one-half to three months.

W A. CLARK.

Fobes, J H : *Plan and Scope of the Lumbar Incision*. *J Am. Inst. Homoeop.* 19 6 ix, 508.

Fobes calls attention to the ease with which the appendix and gall-bladder can be reached through the lumbar incision. He recommends its employment in exploratory operations in which the kidney is suspected and in cases where in addition to renal trouble the appendix or gall-bladder is involved.

His conclusions are as follows (1) Hernia and many other complications of the anterior incision are practically unknown. (2) Through the lumbar incision it is not only possible but reasonably easy to perform satisfactory operations upon the appendix and gall bladder as well as the kidney (3) It is much better to clear up the pathology of a

case through a single lumbar incision, than to make two incisions or to operate in two or three stages.

ALBERT EBRENFRIED

ASEPTIC AND ANTISEPTIC SURGERY

Wright A. E., Tanner H H and Matson R. C : *A Rose-Irrigator for Supplying a Therapeutic Fluid Continuously and at a Standard Temperature to the Whole Surface of a Wound* *Lancet* Lond. 1916 cxd, 821

The authors describe and fully illustrate a multiple rubber tube irrigating apparatus based upon the ordinary garden water pot with a rose, which provides a convenient mechanism for breaking up a large stream into a number of small ones for the irrigation of an extensive surface. The employment of the apparatus, together with the methods of overcoming difficulties incidental to its use are fully described. In a footnote the authors point out that it is doubtful whether physiologic requirements in the matter of temperature could be conformed to when irrigating with hypochlorite antiseptics, for experiments have shown that both enol and Dakin's fluid very rapidly lose antiseptic potency when kept warm even when kept at a temperature of blood heat.

P G SKILLMAN JR.

ANÆSTHETICS

Jorge J M : *Local Regional Anæsthesia in Operations on the Neck* (*Anestesia local regional e infiltrativa en las operaciones de cuello*) *Rev Asoc. Méd. Argent.* 1916 xxv 459

The author reviews the various techniques of local anæsthesia and having tried many is of the opinion that the method of Provost has the greatest advantages. Provost selected two points on a line from the posterior part of the extremity of the mastoid to the lateral tubercle of the sixth cervical rib. The selected points correspond to the intersection of this line by horizontal lines one running from the lower edge of the inferior maxillary and the other through the most prominent point of the thyroid cartilage. A solution injected at these points in the neck will infiltrate the soft parts and nerve-branches in the vicinity of the transverse apophyses and produce a peritricular anæsthesia of all the plexus.

Jorge directs the needle toward the anterior plane of the transverse apophysis and deposits the anesthetic solution, which is a 1 to 10 per cent solution of novocaine-adrenalin in the quantity injected varying from 4 to 6 ccm. The needle may be passed through the sternocleidomastoidean muscle or it may pass tangentially to it at its posterior edge. The regional anesthesia should be complemented by a subcutaneous infiltration at the site with a weak novocaine-adrenalin solution.

Jorge has found this anesthesia sufficient in the greater part of the interventions which he has performed in affections involving the neck and with it alone he has been able to extirpate neoplasms of enormous size, cysts, and different adenopathies and to make excisions of the sternocleidomastoidean muscle. In some laryngectomies it has sufficed but in others a perilaryngotracheal infiltration was necessary to terminate the dissection of the diseased larynx. This complementary anesthesia is employed naturally to reach the sensitive innervation in certain regions of the neck.

With para-vertebral anesthesia Jorge has executed his various operations with a complete exit, perfect insensibility of the patient and even in cases where the intervention lasted up to two hours.

W. A. BRENNAN

Nassau, C. F.: Infiltration Anesthesia. *Thorp Gaz.* 9, 6, 24, 76

Nassau gives his technique for performing appendectomy under local anesthesia. He uses a tablet containing $\frac{1}{4}$ grain cocaine and $\frac{1}{400}$ grain adrenalin. Two tablets are sterilized by dry heat in a temperature slowly rising to just short of 100°C. One tablet is dropped into 50 ccm. of salt solution and the second into 100 ccm. The stronger solution is used for infiltrating the skin, blocking nerves, and for particularly sensitive areas. The weaker solution is employed for general infiltration of tissue. Three Record syringes are used: two of 5 ccm. and one of 10 ccm. capacity with two fairly fine needles: 5 inches long, and two 4 inches long. A knife with keen edge, a pair of sharp straight Mayo scissors, and fine-pointed artery clamps will facilitate this kind of work.

Usually $\frac{1}{2}$ grain morphine is injected one-half hour before operation. With this may be given scopolamine $\frac{1}{100}$ to $\frac{1}{50}$ grain. A capable person should stay at the patient's head to distract his attention from the operation. Pre-operative preparations and instruments should be excluded from his range of vision, and needless conversation should be avoided. His position upon the operating table should be made as comfortable as possible.

Using a 5 ccm. syringe filled with the stronger solution and a fine needle, a small wheel is produced in the skin. From the center of this infiltrated circle the needle can be painlessly inserted to its full length in (or out of) the skin parallel with the surface. As the point of the needle travels the solution is fed from the syringe. After the super-

ficial infiltration, a coarser and longer needle is used for the subcutaneous tissue.

The easiest approach to the appendix under local anesthesia is by the muscle-splitting incision. The aponeurosis of the external oblique is exposed and infiltrated. A split in the aponeurosis is started with the knife and finished with Mayo scissors; gentle snips with the scissors cause less pain than knife dissection. The aponeurosis is retracted carefully, and the internal oblique is infiltrated and split. The transversalis and peritoneum are infiltrated with the stronger solution. Incisions in all layers must be of ample size to obviate undue retraction.

Up to this point the patient should experience no pain unless a vein has been clamped without previous infiltration with the stronger solution. The visceral peritoneum may be cut and stitched with impunity but traction upon the mesentery immediately causes a general cramp-like pain, and rigidity of the abdominal wall. If the appendix is adherent or lies under the cecum, a few inhalations of nitrous oxide may be necessary during its freeing up. The gas need not be continued after the base of the appendix is reached. Traction on the meso-appendix must be gentle, and before tying, it should be infiltrated with the stronger solution. Tying of the appendix is not accompanied by pain. Occasionally the necessary traction on the mesocolon will cause nausea, which is relieved as soon as the traction ceases.

Suture of the abdominal wall follows without special conditions, except that tiny gutta-percha drains, left just under the skin at one or both ends of the incision to take care of any oozing that may occur after the effect of the adrenalin has worn off.

In young children and neurotic persons infiltration anesthesia is impractical. **Ataxer Ekenstam,**

Weston, T. A. Report on 179 Cases Operated upon Under Spinal Anesthesia. *Brit. M. J.* 9, 4, 1904.

For operations upon the abdomen and lower limbs the lateral posture was used for the injection for perineal the sitting-up posture. The height of anesthesia reached in each case was carefully noted and found to be usually the nipple line, although in some cases it extended a little higher.

The average time at which anesthesia was complete was found to be three and a quarter minutes, the moment of injection being carefully recorded in each case. The duration of the anesthesia was found to be ample for the cases under consideration, lasting usually fifty to sixty minutes, though in some cases longer.

As to the after-effects, no serious untoward effects were observed either during or after the injections. A few patients experienced slight dyspnoea during abdominal operations if the anesthesia reached above the nipple line, but this disappeared rapidly on slightly elevating the shoulders and head.

Slight headache occurred in one or two cases after operation but was immediately abolished by the administration of phenacetin and caffeine. Weston believes that this headache is entirely due to unskillful handling of the patient because he noticed that if the patient was moved with extreme care no headache occurred. To minimize the shaking of the patient it is a good plan to have under the body a canvas stretcher upon which the patient can be moved from the table to his bed by the insertion of two bamboo poles—the table having previously been wheeled alongside the bed. If great attention is paid to these details Weston is sure no headache would ever occur.

As to the advantages of spinal anesthesia, the principal one is the perfect relaxation obtained in abdominal and rectal operations. The portability of the necessary apparatus is also a great advantage especially under tropical conditions where it is often difficult to obtain an anesthetist. Shock and respiratory disturbance are also greatly diminished, and this tends to a speedier convalescence. As regards the patient's choice Weston has always found that when patients have submitted to both general and spinal anesthesia they invariably prefer the latter. It was very noticeable that in a regiment soldiers frequently asked to have spinal anesthesia because their pals had had it, in preference to a general anesthetic.

As to the disadvantages they are mostly attributable to lack of experience the more experienced one becomes in the technique, the fewer the disadvantages. The main disadvantage however is the limitation of the sphere of the operation to parts of the body below the nipple line.

P. G. SKILLEREN JR.

Zeno A.: Oxo-Oxygen Protóxido Anesthésia (La anesthésia por el protóxido de oxo-oxígeno). *Rev. Asoc. méd. argent.* 1916 xxv 68.

According to the author anesthesia by oxo-oxygen protóxide is the most humane, secure and agreeable method proposed up to the present time. It is principally indicated in operations of short duration and with patients whose general condition is not up to standard. If a deeper narcosis is desired especially in abdominal operations, recourse must be had to ether with the same apparatus.

The principal inconveniences are the high cost and the difficulty of obtaining competent anesthetists.

In endo-abdominal interventions the author has employed an associated method which consists in the prior administration of morphine, rachidian analgesia sufficient to operate without other agent, narcosis with oxygen protóxide with or without complementary ether. In the author's opinion this method has these advantages: Suppression of pre-operative anxiety, the enormous relaxation of the walls and viscera which is seen only in rachidian analgesia and which much facilitates operative technique, elimination of the psychic shock which

is always observed in patients with difficult cases and where the intervention is long and tedious.

W. A. BRENNAN

Rowe, L. W.: Trichlor Tertiarybutyl Alcohol Anesthesia. *J. Pharmacol. & Exp. Therap.* 1916 lx, 10.

The author reviews the work that has been done with this compound in the production of anesthesia, and while he does not advocate its use as a general anesthetic in human surgery because of the very prolonged action of the drug and the consequent slow return to consciousness since no antidote for its action has yet been discovered, he believes that as an anesthetic in experimental pharmacology or physiology where the recovery of the animal is not absolutely essential the compound has proven almost ideal.

Regarding its employment he states: Trichlor tertiarybutyl alcohol can be used in experiments where the recovery of the animal is desired if a preliminary narcosis is produced by a hypodermic injection of morphine and followed with an intraperitoneal injection of 0.2 gram trichlor tertiarybutyl alcohol per kilo. This anesthesia will last four or five hours and recovery will be gradual but sure. Under these conditions more time is required to bring about the anesthesia, and the nausea produced by the morphine is a disagreeable feature. However there is the marked advantage that the operator can work without the aid of an anesthetist and that there is a steady plane of anesthesia for the work.

In summarizing the advantages of trichlor tertiarybutyl alcohol as an anesthetic in animal experimentation, it can be briefly stated that a dose of 0.4 gram per kilogram body weight injected intraperitoneally produces rapid and complete anesthesia lasting from twelve to forty-eight hours with the one injection. It is easily administered, requires no attention after the first dose, and gives a very steady plane of anesthesia which is well suited to blood-pressure investigations or experimental surgery of all kinds. If the recovery of the animal is desired morphine narcosis should be first produced and followed with one half the above mentioned standard dose of the drug.

GEORGE E. BERRY

SURGICAL INSTRUMENTS AND APPARATUS

Ridlon J.: A Leg stretching Machine. *J. Am. M.* 47: 1916 lxvii, 1752.

Ridlon has devised a simple, easily packed and transportable apparatus for obtaining traction abduction and fixation in certain types of tuberculous hip fractures about the upper femur and knee deformities. It allows good fixation and application of plaster casts after the desired position is obtained, thus offering a wide field of usefulness.

H. W. MEYERSON

SURGERY OF THE HEAD AND NECK

HEAD

Pfahler G E. The Treatment of Malignant Diseases About the Mouth by Combined Methods. *J Am. Med. Ass.* 9 6 livii, 502

There are four different methods of treatment of malignant diseases occurring about the mouth: surgical removal, local destruction by means of electrothermic coagulation, deep roentgenotherapy and the application of radium in the mouth.

The author believes that electrothermic destruction gives better results than excision in the mouth. He urges, however, the excision of the palpable metastatic glands in the neck. Following this treatment deep roentgenotherapy should be thoroughly applied, making use of as much cross-firing as possible. Electrothermic coagulation is produced by the resistance offered to the flow of electricity through the tissues. The effect can be thoroughly controlled by varying the relative sizes of the electrodes. The greatest destruction develops in the axis between the two electrodes with progressive lessening at the edge of the magnetic field between them. In this process usually there is no bleeding; coagulation necrosis taking place. This prevents lymphatic metastasis. One must also be sure to destroy the entire diseased area, for there is danger of rapid extension from the periphery if the neoplasm is not entirely destroyed. This tendency to increased growth is probably due to the increased vascularity as a result of the treatment. Those cases suitable for this method must be so situated that the tissue can be included between two electrodes.

Metastasis to the glands of the neck does not offer this opportunity. It is of doubtful utility in sarcomata. Here the author advises roentgenotherapy alone. The advantages of this type of treatment are:

The disease is destroyed by conductive heat which gives a zone of devitalization without the actual destruction of the healthy tissue.

2. There are no raw surfaces to permit transplantation.
3. No blood or lymphatic vessels are opened.
4. Hemorrhages are not feared.
5. There is no local infection.

The object of deep roentgenotherapy as an adjunct is to destroy the outlying cells that may be missed in the coagulation process. The author believes that radium should be used only in the mouth and not on the outside. He sees no advantage of radium over the roentgen ray when used from the outside.

Among primary cases treated by the roentgen rays alone, he reports 8 cases of epithelioma of the lip treated by roentgen rays alone. Of these, 7 patients recovered and have been well from a few months to eight years.

All primary cases treated by coagulation and roentgen rays have recovered from the epithelioma of the lip and remained well to the present date which is from a few months to seven years after the operation.

He reports 4 primary cases treated by surgery and roentgen rays, all of which have recovered and have remained well from two or thirteen years. Three cases of local recurrence following excision treated by roentgen rays have recovered. One has died from intercurrent disease but had remained well for several years. One patient is well after two years, and a third has been well seven years.

Of recurrent cases treated by roentgen rays and electrothermic coagulation, two patients have remained well for a year each.

The author believes that in the early stages of lip cancer he will be able to cure 100 per cent.

Of 6 cases of epithelioma involving the dorsum of the tongue, 1 died, and 4 recovered and have remained well from one to four years. One case is too recent to classify.

Of 6 cases of epithelioma involving the floor of the mouth, 5 developed recurrences, 3 have died, and 3 are still under treatment.

In epithelioma involving the cheek bone, cheek gums, jaw bone, and submaxillary glands, he has been disappointed in his results.

HARRY G. SLOAN

Speckman W C. Fracture of the Maxilla. *Med. Surge.* 9 6 xviii 514.

The author describes the treatment of two classes of wounds of the face involving the maxillaries: one of which there is little loss of osseous tissue and which requires little else than a mechanical fixture for holding the teeth of the upper and lower jaw in occlusion until repair has taken place. The other is a class of fractures more severe and complicated, the result of a missile of greater size producing several fractures and loss of considerable tissue. The article deals principally with the technique which the author has used more or less successfully in the latter class of war injuries.

ROBERT B. CORFIELD

Sharpe W. The Operation of Cranial Decompression for Certain Intracranial Conditions. *W. M. J.* 19 6 173

After discussing various phases of modern cranial surgery the author concludes that the operation of cranial decompression is one which should be used much more frequently than it is at present, especially in the conditions of brain tumor, fracture of the skull, brain abscess, and selected cases of spastic paralysis due to an intracranial hemorrhage at birth. The subtemporal method of cranial decompression is the ideal route besides being

less difficult technically. It exposes an area of the brain most frequently involved. This permanent decompression opening does not weaken the skull in that the thick overlying temporal muscle protects it most adequately so that hernie cerebri are not to be feared. The operative mortality is low. Patients with intracranial conditions should not be permitted to become blind or to reach the dangerous stage of medullary compression without a subtemporal decompression being performed early.

Subtemporal decompression is indicated first for the relief of intracranial pressure: (1) tumors of the brain, (a) localized tumors of the brain, viz. large cerebral tumors, irremovable tumors of the base of the midbrain, (b) unlocalized tumors, (2) fractures of the skull, (3) fractures of the vault, (a) linear fractures with no depression of the fragments, (b) depressed fractures of the vault, (4) fractures of the base of the skull, (5) brain abscess particularly of either temporosphenoidal lobe, (6) selected cases of cerebral spastic paralysis, (7) as an exploratory procedure. After discussing these various conditions the author describes in detail the technique of the operation. Various statistics are given, among others the author's of 139 cases of fracture of the base.

P. G. SKILLER, JR.

Constantini P.: Lavaggio e Antisepsi del Rachidiano in un caso di Meningite traumatica. *Gazz. d. op. e d. dis. Milano* 916 xxxvii 1143

In a case of traumatic meningitis resulting from a base cranial fracture after a bicycle accident, Constantini made a lumbar puncture and after the extraction of about 100 ccm. of non purulent but turbid fluid injected 5 ccm. of isotonic electrargol. This was followed in a short time by a fall of 3° in the temperature. The cerebrospinal fluid showed the evidence of an acute inflammation but no micro-organism could be detected. The injections were continued (after extraction) for five consecutive days with a constant improvement in the symptoms. Cessation of the injections caused a recurrence of the intensive symptoms and a return of the high temperature. The injections of electrargol were resumed for the following seven days and then were followed by phenol injection for a few days more. All meningitis symptoms disappeared and the patient completely recovered.

It is pointed out that Wolff in 1915 injected electrargol in cases of cerebrospinal meningitis with previous anesthesia of the dural sac, and Constantini himself has several times injected electrargol in the epidemic form of meningitis.

This case however is the first in which he has used this method in traumatic meningitis, and the excellent result is encouraging. He also mentions that although the usual practice is not to extract more than 20 to 30 ccm. of spinal fluid in this case he extracted 80 to 100.

W. A. BRENNAN

Heuer G. J. and Dandy W. E.: Roentgenography in the Localization of Brain Tumor Based upon a Series of One Hundred Consecutive Cases. *Bull. Johns Hopkins Hosp.* 1916 xxvi, 311

From the study of roentgenograms made from 100 patients with symptoms of brain tumor the following summary is presented:

1. With the exception of the comparatively few which show definite tumor shadows roentgenograms of the head are merely an aid though an important aid in the diagnosis of brain tumor.

2. Uncalcified tumors do not cast shadows in the roentgenogram unless tumor tissue has invaded the accessory sinuses. A possible exception may be hypophyseal lesions which are viewed against the dark temporal fossa.

3. Calcified or bony tumors cast shadows which are readily recognized. In our experience such shadows occur in 6 per cent of patients with brain tumor. Judging from the literature however our experience has been fortunate.

4. The sign in the skull of increased intracranial tension, i.e. enlargement of the skull, separation of the cranial sutures, general convolitional atrophy and destruction of the sella turcica, have a considerable value in the differentiation between cerebral and subtentorial lesions for they indicate an internal hydrocephalus which in our experience occurs only rarely in cerebral tumors but is the usual accompaniment of posterior fossa tumors. It is of importance to remember that destruction of the sella turcica may be a general pressure phenomenon, especially in the differential diagnosis between suprasellar and cerebellar tumor in blind patients.

5. The local changes in the skull due to brain tumor are in the author's experience, of greatest value in the diagnosis of hypophyseal or suprasellar lesions. The combination of characteristic eye-changes and local sellar destruction or enlargement makes the diagnosis the most certain perhaps, of all intracranial conditions.

6. Local hypertrophy of the skull over cerebral tumors is of definite diagnostic value and has occurred in 4 per cent of the author's patients. Local atrophy of the skull over tumors is of equal diagnostic importance but has occurred in only 3 per cent of the patients. Local unilateral vascular changes also have definite diagnostic significance and have occurred in 4 per cent of the patients. Local convolitional atrophy is of importance in the focal diagnosis of tumor only when demonstrably unilateral—in the authors experience this has been rare. Local enlargement of the internal auditory meatus has thus far in their experience had little diagnostic value.

7. The usual position and characteristic appearance of shadows due to the calcification of structures normally present in the intracranial chamber should be remembered.

8. In about 45 per cent of the patients in this series roentgenography has been of real diagnostic value.

As early as 897 experiments had been made to show that brain tumors could be shown from preserved specimens, but it was entirely a different matter to produce the same shadow upon the living even with the most modern equipment. The normal irregularity of the skull with the different shadows and pseudoshadows that are naturally produced makes the study of brain tumors most difficult matter. Their results were verified either by operation or autopsy in 68 while 66 were operated upon. In 32 they hesitated to make final report

From an X-ray standpoint the authors divided the cases into three groups: (1) where the tumor cast a shadow; (2) where the tumor did not cast a shadow but caused some deformity of the skull that could be recognized; (3) those that gave no evidence upon the roentgenogram.

A second subdiagnosis was made in the first true tumor shed was (1) unaltered tumor (2) circumscribed tumors. The second changes with skull tumor has a longer list and is again further subdivided (3) changes the skull due to general pressure (4) enlargement of the skull (5) separation of the cranial sutures (6) general reduction of atrophy (7) lesion of the sella turcica (8) local changes the skull (9) local hypertrophy of the skull (10) local expansion or enlargement without destruction (11) local atrophic changes (12) local constitutional atrophy (13) local sella lesion (14) local vascular changes in the skull etc. etc.

Extensive tables are given illustrating the use of the
theorems of these classes as well as some cases give
in detail, especially where comparisons are made
between those instances where the above upon the
plate and symptoms might lead to confusion.
Tables also are included where the shall we per-
shadow or irregularity of the skull might be mis-
taken for tumors or other conditions with those of post-
cranial origin.

W. S. N. XL

Schulze Lumbar Puncture in Brain Tumors

Schulzke calls attention to the danger arising from the post-lumbar puncture brain tumor cases. He mentions the case of a boy who fell from a height of his father's and who soon afterwards right-sided hemiparesis in addition to cerebral paralysis of the same side. The history of the case prior to the fall presented the existence of binocular strabismus which no doubt was complicated by falling by meningeal or cerebral hemorrhage. The pressure of the cerebrospinal fluid was 33 mm. and the fluid was clear. Only sufficient fluid was extracted by puncture to render the pressure normal. On the same night there was vomiting and the following day heart failure and death occurred. Autopsy showed a glioma on the pons, left half of the pons which was partly covered by a fresh hemorrhage. This hemorrhage seems unquestionably to have been due to the removal of the cerebrospinal fluid.

Bracon P. Tumors of the Third and Fourth Ven-
tricles. *J. Am. Med. Ass.* 1961; vol. 45.

A series of six cases of tumors of the third and fourth ventricles is reported by the author in detail one case being an involvement of the third, and five of the fourth ventricle.

According to Welschburg the symptoms of tumor of the third ventricle are (1) exophthalmos (2) paralysis of the associated ocular movements (3) large pupils with impaired reaction (4) ataxia of the rebellious type.

The first case occurred in a boy 14 years old, with rather precocious genital and hairly development suggesting hyperplasia. There was limitation of ocular movements, papillitis and blindness (taxia heads), drowsiness and mental dullness. The patient died. Necropsy showed a soft tumor involving the third ventricle and a second hydrocephalus. The histological report was soft glioma.

The histological report was not given. The fourth ventricle are much more. The ventricles clinically are frequently those of meningitis: stiffness of the neck and petal pain and increase of cells globulin, and pressure in the pleural fluid. Sudden death is very frequent.

The second case occurred in a boy of two and one-half years. Early symptoms suggested meningitis. Examination of the spinal fluid showed an increase in cells both polymorphous and mononuclear and no bacteria. Lymphulitis was present. The symptoms lasted two and a half months when the patient suddenly died. Necropsy showed large hardening of the first entrance breaking through and almost surrounding the pons. The histological report was glioblastoma.

The third case in girl five and one-half years of age showed frontal picture of cerebellar tumor. Suboccipital operation was attempted but the patient died before the dura was opened. Necropsy showed small tumor in the upper part of the fourth ventricle with marked hydrocephalus. The histological report was glioma.

The 1st rib was that of a man 58 years old with respect to history and symptoms of cardiovascular trouble. He showed mental deterioration delirium and delirium. He died suddenly. Necropsy showed a small scale tumor in the floor of the 1st rib (tr). The histological report was glioma.

The fifth case was a man in 38 years old, who for five years had complained of headache, dizziness, and vomiting with gradually relative weakness in the left side. He showed mild mental deterioration and symptoms of cardiac renal trouble. Death occurred from hypostatic pneumonia. Necropsy showed a female tumor in the floor of the fourth ventricle. The histological report was glioma.

The sixth case in a boy five years old began with headaches, and failing vision. He showed adipsity, unsteadiness, papillitis and genital trophy. Later blindness occurred followed by two convulsions and marked general weakness. A right subtemporal decompression was done but death shortly followed.

Necropsy showed a tumor filling the fourth ventricle. The histological report was small round-cell sarcoma.

In the treatment of these cases it appears that any sudden interference with intracranial pressure is dangerous; yet the author believes that operative removal of tumors of the fourth ventricle is not theoretically impossible, the ventricle being entered through the vermes, or below, provided the pressure in the posterior fossa is not dangerously high. To avoid this it is suggested that the operation be postponed until the subsidence of headache and other pressure symptoms, and that a preliminary callosal puncture or puncture of one of the lateral ventricles be done according to Professor Anton of Halle.

P. M. CREAG.

George H. T.: The Accurate Radiography of the Pituitary Fossa and of the Sphenoidal Sinuses. *Arch. Radiol. & Electrol.* 1916 2d 169.

The author describes in detail a method of obtaining accurate plates of the sella. His method is a modification of the so-called Finzi method, in which coins are placed in the ears. As in the case of the Finzi method, the fluoroscopic screen is used to obtain the proper position of the head.

Instead of the coins, the author uses a large circle of lead and a smaller lead disc, which is imbedded in cardboard. The lead ring is placed over one ear and the disc over the other and by means of the fluoroscope the lead disc is brought in the center of the circle of lead, and plates made after the tube has been properly centered as regards the ring and disc. The only chance for error of course is an asymmetrical position of the ears and the author thinks this can be disregarded.

The measurements suggested for the lead ring are 20 millimeters over all and the diameter of the circle inside the ring 14 millimeters; the thickness is 15 millimeters; the diameter of the lead disc suggested is 7 millimeters.

After centering the tube and having the head in proper position the tube is carried 3 centimeters forward and 2.5 centimeters upward.

The necessity for holding the exact lateral position of the head in making roentgenograms of the sella turcica can be best illustrated by the study of a skull under the screen; the slightest change in the position of the head giving a marked distortion of the measurements of the sella.

The article is illustrated by several views of the sella made with and without the proper position of the head.

W. A. LYMAN.

Marañon: Traumatic Lesion of the Posterior Lobe of Hypophysis. Typical Froehlich's Syndrome; Diabetes Insipidus (Lesions traumáticas del lóbulo posterior de la hipófisis síndrome de Froehlich típico diabetes insípido). *Rev. de med. y ciruj. pract.* Madrid, 1916 xl 104.

A boy of 13 years received a pistol wound in the frontal region a few millimeters to the right of the medial line. There was a slight hemorrhage

which soon ceased but there were no other observed effects. After about 20 days the urinary output was increased to 6 or 7 liters per day without glycosuria or albuminuria. Seven months after the accident the boy showed diabetes insipidus complete sexual infantilism, extraordinary increase of abdominal fat particularly in the epigastric and supra-pubic regions.

In the presence of such symptoms, the author believed that the bullet lodged in the hypophyseary region and radiography confirmed this. Lateral projection showed the projectile detained in the infundibular region tending toward the clinoid posterior apophysis having thus injured the infundibulum, the pituitary stem, and possibly compressing the posterior lobe. Frontal projection showed the bullet in the sella turcica region without descending to the fundus and somewhat to the left.

Marañon thinks that this case demonstrates in a definite manner how Froehlich's syndrome is brought about by a lesion of the hypophysis in the infundibular region and in the hypophyseal stalk and it confirms the hypothesis maintained by Cushing especially that section of the stalk produces the same effect as destruction of the hypophysis itself. The case is moreover a very definite and complete confirmation of the pathogenesis of diabetes insipidus. Examination of the nervous system as well as the visual apparatus showed no disturbance.

W. A. BRENNAN.

NECK

Morestin H.: Tumor of the Inter or Retrocarotid Corpuscle (Tumeur du corpuscule inter ou rétro-carotidien). *Bull. et mém. Soc. de chir. de Par.* 1916 6 xlv, 2308.

The little organ designated by the names of intercarotidean ganglion, carotidean gland or retrocarotidean corpuscle is but rarely the site of a tumor. There are only about 12 such reported in the literature.

Morestin gives the clinical details of a case of this kind which he operated upon. The tumor was the size of an egg and the dissection was extremely slow and difficult on account of the anatomical difficulties. None of the vessels or nerves of the region were injured in the extirpation. The specimen after removal was histologically examined and found to be a carotidean paraganglioma.

W. A. BRENNAN.

Porter M. F.: The Surgical Treatment of Goiter. *Ann. Surg.* Phila. 1916 lxxv 395.

The author expresses his opinion as to how the results achieved by surgical treatment can be improved. Of the cases which die without operation some have been refused operation because of coexisting nephritis or diabetes conditions which should argue for rather than against operation since the signs frequently disappear with those of exophthalmic goiter.

The percentage of failures and deaths following thyroidectomy would be materially reduced if judicious surgery were employed and more frequently. It should be the rule to remove all permanent goiters whether they are producing symptoms or not on the same grounds that we remove warts, moles, and chronically inflamed areas to prevent their becoming malignant.

Recurrences can be prevented by removing enough of the surrounding tissue at the primary operation. The author removes from six-eighths to nine-tenths of the gland and in over one hundred cases has had no recurrence nor a single case of myxedema. All nodular areas should be completely removed as these are especially prone to malignant degeneration. A warning is given to be on the lookout for hyperthyroidism in cases to be operated upon for other conditions.

Failure to get relief from operation though there be no recurrence of the goiter is usually due to incomplete removal of diseased tissue. The author recommends a large incision with complete exposure of the gland and removal of all diseased tissue. If the whole area is involved, only a very small portion is left.

To reduce the immediate mortality of operation the author recommends the substitution of boiling water injections for ligation preliminary to thyroidectomy by using the injections as a substitute for all operative interference in mild cases with little or no enlargement of the thyroid and in extremely grave cases. Anorexia, diarrhoea, and mental derangement are especially unfavorable symptoms. There is no way to differentiate the cardiac symptoms due to myocardial changes and those due to thyroid toxemia.

E. FISCHER.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Fischer L. C. Cancer of the Breast. *J M A* 43: 96 vi 7

The author sent to some of the leading surgeons in the United States the following questionnaire: First, is cancer on the increase? Secondly, what percentage of cancer of the breast recurs in your clinic? Thirdly, what percentage of patients die as a result of primary operations? Answers, together with statistics, are given by Deaver, Rodman, Bloodgood, Morris, McGuire, Ochsner and Kelly. According to these surgeons' reports, permanent cures after operation for cancer of the breast range from 35 to 72 per cent.

The remainder of the paper is devoted to citing statistics from various European clinics, to a description of the Rodman operation, to citations from Murphy's writings on cancer, and to abstracts of cases operated upon by the author.

P. G. SKILLERN, JR.

Pauchet, V. Treatment of Pleural Fistulae (Traitement des fistules pleurales). *Presse méd.* 96 p. 604.

Pleural infection results either from a chest injury or from an infection of the respiratory passages. Both pathological conditions being extremely frequent the occurrence of fistulae is frequent. Before any attempt is made to treat such fistulae the surgeon must acquaint himself with two essential facts: (1) the resistance and state of vitality of the patient and (2) the extent and limits of the suppurative area.

If the patient is chronically infected it is necessary to first disinfect the pleural cavity. For this the surgeon, either by the X-ray or by exploratory puncture, will determine the lowest point of the cavity. He will make an opening at this point with or without costal resection and place a drain. The

cavity will be freely and completely drained. The patient should be kept in the open air should use the spiroscope, respiratory gymnastics, and sun baths.

When the general condition of the patient is satisfactory he will be able to support a radical intervention. The choice of operation, which in any case is extensive, is based on a careful radiologic examination which will determine the type of the lesion (multilocular empyema, bilocular empyema, anterior cavity, subdiaphragmatic cavity, etc.).

For the radical treatment of chronic empyema three operative methods are available: (1) pleurocostal resection, (2) decortication of the lung, and (3) tamponade of the cavity but often it may be necessary to combine two or even all three of the methods, either at one sitting or at successive intervals.

1. In pleurocostal resection the ribs covering the suppurative area are removed. The resection should extend 1 or 2 cm. beyond the limits of the area. The suppurative area is then carefully sounded or examined radiographically. Under the excised ribs a thickened pleural layer will be found which should be excised, the skin and muscular covering only being left.

In pulmonary decortication if the lung is supple and elastic and there is no fibrous transformation it must be freed from its pleural prison. The thickened pleura which smothers the lung must be removed. The procedure is not easy and the author points out the difficulties that are experienced in obtaining a good application of the freed lung against the thoracic wall. To favor pleuropulmonary adherence the wound must be closed and aspiration instituted. If it is drained air enters and there is no tendency to create a void.

Pauchet has treated a series of patients by pulmonary decortication, having first carefully pre-

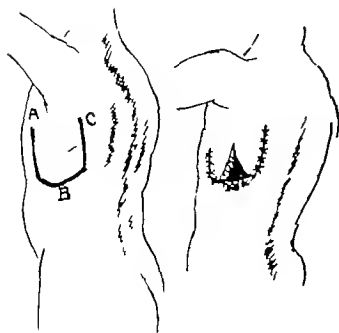


Fig. 1

Fig. 2

Fig. 1. V incision for abscess of the posterolateral pleural cavity. The ribs are shown by dotted lines. Line A corresponds to the middle of the axillary hollow. Line C is about two finger breadths from the vertebral column. Line B corresponds to the lowest point of the pleural area.

Fig. 2. How the foregoing will look after reparation. The operator incises a part of the cutaneous strip so as to widely tampon the suppurative cavity.

pared and examined them. All have recovered but all have shown complications. They have recovered because they were rigorously prepared. If they had been operated upon in a cachectic state they would have died.

3. In tamponade of the cavity the cavity may be long and narrow passing along the vertebral column or may form a sort of cavern between two pulmonary lobes or on the diaphragm. The author has tried adipose grafts in the attempted tamponade of these cavities but the results were failures as the graft was always eliminated. He now employs myoplastic tamponade as advocated by Mayo, using a living strip of thoracic muscle. The technique is described and the incisions used in the different procedures are illustrated.

Panchet says that the problem of treating empyema is a purely mechanical one. It is merely filling a void, either by bringing the lung toward the thoracic wall or bringing the thoracic wall before the lung. It may take a full year to effect it in several operations.

The technique of the treatment is briefly as follows:

1. Prepare the patient for radical treatment by drainage and by physical treatment.

2. When the patient is resistant, make a precise diagnosis by the aid of radiocopy and choose between the three operations—pleuricostal resection, decortication, and tamponade of the cavity.

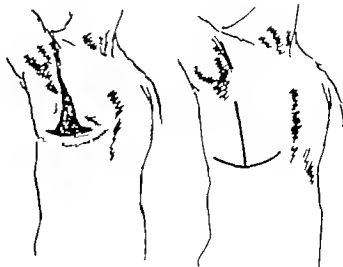


Fig. 3

Fig. 4.

Fig. 3. Incision for anterolateral pleural abscess—shape of reversed T.

Fig. 4. How the cavity will appear after distention.

3. Regional anesthesia should be used, no narcosis.

4. Hemostasis should be used for perfect results and the after-care should be carefully supervised.

5. Do not fear to perform the operation in two or three stages, even at intervals of several months.

W. A. BAZEMAN

TRACHEA AND LUNGS

Means, J. H., and Balboul, G. M.: The Various Factors of Respiration in Persons with Pneumothorax. *J. Exp. Med.* 1916 xlv 671.

In connection with the study of the respiration in experimental pneumonia, recently reported by Newburgh Means, and Porter it seemed desirable to the authors to find out what effect a great reduction in the functioning lung surface would have on the various factors of respiration. Since pneumothorax presents this condition the present research was undertaken. The author's observations were made upon four cases in which pneumothorax was being produced for the treatment of pulmonary disease, and upon one case of spontaneous pneumothorax.

The observations on these five subjects showed that all the factors of respiration are essentially normal in persons with one lung collapsed. The gaseous exchange was normal, for if the basal metabolism be calculated, normal values are obtained 37.3 calories per sq. mm. per hour for Case 1, 42.0 for Case 2 and 36.9 for Case 3, all within 10 per cent of the normal average for women of their age. The respiratory quotients were perfectly reasonable except that that of 0.71 for Case 2 which is somewhat low. This patient was, however, the subject with the most active tuberculosis which the authors observed, and might easily have had an increased catabolism and so reach a fasting respiratory quotient sooner than a normal subject.

The respiration rate, the volume per respiration, and the total ventilation of the lungs in the three cases in which they were determined, were all probably within normal limits though possibly the total ventilation in Case 5 was a little higher than is usually found. The percentage of carbon dioxide in the expired air was within normal limits in Cases 1 and 3 but somewhat low in Case 5.

The alveolar carbon dioxide by the Plesch method the authors found normal in Case 1 (14.3 mm.) and Case 5 (4.5 mm.) but somewhat low (30 mm.) in Case 2 which they believe probably explains the low percentage of carbon dioxide in the expired air and the higher ventilation of the case of the last subject and it may have been due to very slight acidosis.

From their observations the authors believe it may be said that at least all the factors of respiration, gaseous exchange, carbon dioxide tension and the mechanical factors, are normal in persons with a

collapsed lung that the reaction to carbon dioxide is normal up to the point at which the respiration is trebled or sometimes quadrupled but that beyond that point a limit may be reached.

The ventilation of the lungs they state, can be accomplished in an entirely normal manner in spite of a greatly reduced vital capacity and the only difference between normal persons and persons with a collapsed lung is that the latter when called upon to increase their ventilation reach their limit a little sooner than the former.

From these findings it seems to the authors that there will be no dyspnoea except after moderate exertion which deduction is borne out by the histories of the patients. In other words, they say in the lungs as in other organs there is a large factor of safety. A lung being as efficient as two, except when the work done calls for more than a threefold increase in the normal ventilation.

GEORGE E. BRIDGES

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Belaustragal F. Congenital Diaphragmatic Hernia Operated and Cured (Hernia diafragmatica congenita operada y curada). *P. med. arg. n.º* 964, 1913.

The patient in this case reported simultaneously with the symptoms of her first pregnancy experiencing exceptionally severe gastric disturbances which increased so much that the pregnancy terminated in an abortion after 40 days.

From a radiographic examination her physician believed it to be a case of bilocular stomach and sent her to the hospital.

The result of radioscopic observation and test meals showed that agested bismuth descended by the right side instead of the left and that when it reached the colon, part of the latter was observed to be in the left hemithorax. Hernia was evident and intervention was decided upon. A voluminous hernia was exposed in the left lateral thoracic region, which began to reduce spontaneously.

The whole transverse colon was the thorax radiography has demonstrated that the ascending and descending colons turn toward the iliac fossa following a rectilinear direct or without revealing the iliac sigmoid. The pleura was normal.

As the neck of the hernia was not accessible through the incision the operation was limited to reduction and section of the sac. The diaphragmatic orifice admitted four fingers.

A late operation which was intended was not found necessary as the stomach has since resumed its normal position and gastric disturbances have ceased. The patient history left no doubt that the hernia was congenital in origin.

W. A. BRIDGES

Baillet L. C. Bullet Wrapped in Great Epiploon Mobile in a Hernial Sac (Ball d'obus enrobé par le grand épiploon et mobile dans un sac herniaire). *Progrès méd.* 964 p. 25.

Baillet reports the case of a man who was wounded August 30, 1914 while lying down. He recovered quickly but in the following January he died for the first time the existence of a left inguinal hernia. On examination a round tumor was found in the left inguinal region having the characteristics of an epiploic hernia. The man stated that he felt the presence of a projectile intermittently in this hernia. His statement was confirmed by radiographs, which showed the bullet to be mobile in the sac. On intervention the sac was found to have the same characteristics as congenital hernial sacs; a voluminous epiploic fringe was withdrawn from it, which was appended a round bullet completely enveloped by the serous. There was a cicatricial thickening of the epiploon above it. The recovery was without incident.

W. A. BRIDGES

GASTRO-INTESTINAL TRACT

Richardson E. P. Acute and Subacute Perforations of the Stomach and Duodenum. *Tr. South. S. & G. Soc. White Sulphur Springs*, 96 Dec.

This paper is based on 104 acute and subacute perforations of the stomach and duodenum occurring between 1896-1915 and includes the total surgical experience of the hospital with these conditions. The author's principal object is to consider the late results with especial attention to the divisibility of gastro-enterostomy as a primary measure, although the statistics afforded by this group of cases have been included.

Of 104 cases 90 were operated upon. Of these,

8 showed local abscess, the remaining 82 a diffuse peritonitis. The general operative mortality was 35.5 per cent. The cases of gastric perforation gave a mortality of 50 per cent, the duodenal 31 per cent. During the past decade the mortality of gastric perforation with diffuse peritonitis has remained high, 43.5 per cent while that of duodenal perforation has dropped to 24.4 per cent. One-quarter of the operative deaths or 8 deaths to 32 was apparently due to subdiaphragmatic abscess.

The late results in cases treated without a primary gastro-enterostomy show approximately one half of the cases followed apparently well. The points suggested by a study of this group of cases are

This series gives no evidence that pyloric obstruction is a factor increasing the primary mortality which might be avoided by an immediate gastro-enterostomy.

Gastric perforations carry a distinctly higher mortality than duodenal.

The mortality of both gastric and duodenal perforations is high after middle life.

One half the cases of perforation treated by suture alone were apparently cured following operation.

Therefore, an additional gastro-enterostomy may well be avoided in cases of gastric perforation, in patients beyond middle life and in any case where the general condition or lapse of time since perforation suggests possible death from peritonitis.

This series suggests that for the average surgeon at least the rule should be to close the perforation and the exception to add a gastro-enterostomy.

Sherwood Dunn B: Operating upon the Posterior Face of the Stomach by the Intercolo-epiploic Route. *Am J Surg* 916 xxx 3 3

For perforating wounds of the stomach, where it is necessary to reach the posterior face of the stomach one has the choice of four routes: the gastrohepatic the transmesocolic the cologastric and the new route the epiplo-enterocolic, which exposes the posterior surface of the stomach by separating the greater omentum with its mesentery from the transverse colon. The procedure recommends itself on account of the absence of hemorrhage and the ease with which it is accomplished.

The technique is simple with a bistoury an opening is scratched in the serous membrane of the transverse colon at its junction with the great omentum then by gauze dissection, one is gradually separated from the other without tearing. By lifting up the apron of omentum thus freed the posterior face of the stomach is exposed to full view as well as the pancreas and duodenum.

This route is valuable in a variety of conditions in exploration of the stomach and duodenum for the repair of gunshot wounds of the posterior face in ulcers of the lesser curvature and posterior surface of the stomach, in dissections for cancer of the pylorus and in operations upon the pancreas.

E. K. ARMSTRONG

McGregor J K. Considerations in the Diagnosis and Surgical Treatment of Gastric and Duodenal Ulcer. *Canad M Ass J* 1916 vi, 1003

The author's observations are made from a series of 45 consecutive cases of gastric and duodenal ulcer operated on without mortality. Of these 80 per cent were duodenal the remainder gastric.

The diagnosis was made on (1) personal history and (2) the result of radiography the latter being more important and reliable.

Of the symptoms pain coming on about the time of the next meal is usually the most prominent. It should be remembered however that this pain is not always present and that when present may be due to a cause external to the stomach or duodenum. Tenderness likewise is of doubtful importance, and when marked should suggest perforation. Hemorrhage is rare in duodenal cases.

In gastric cases pain beginning shortly after food vomiting and hematemeses are the important symptoms.

In radiography the combination of the six hour residue and hypertalsis are the most important signs. In gastric ulcer McGregor believes the presence of Haudek's niche on the lesser curvature with an incisure on the greater is a positive sign of perforation.

The diagnosis being made, surgical intervention is advised to relieve symptoms and remove a chance of cancer formation. Hemorrhagic cases however should have a previous medicinal course.

The surgery consists of posterior gastro-enterostomy with special treatment of the ulcer. In the duodenum this means invagination or excision in the stomach resection or Balfour's method of perforation by cautery. Linen sutures are still employed by the author.

Kovsag's idea of diaphanoscopy substituting the cystoscope for the gastroscope to detect the ulcer is highly recommended.

Where ulcer is not found and suspicion points to the duodenum, McGregor advises that an attempt be made to invaginate the duodenum through the pylorus for inspection through a small opening in the stomach. A case is given where this was tried.

The postoperative treatment of these cases is to leave them alone.

The author has had no experience with the vicious circle and believes it to be due to some error of technique. P. M. CHASE.

Dowden, C. W. Gastric and Duodenal Ulcer with Especial Reference to Etiology and Diagnosis. *Am J S* 1916 xxx 316

Ulcer is to be considered only as a symptom of any condition that will produce organic or spasmodic pyloric obstruction and this condition may be present anywhere that chronic infection is to be found. Several ways in which experimental ulcer may be produced have been shown and experimental proof of the constitutional origin of ulcer has been advanced but there remains a difference of opinion

as to how this is done, though generally speaking all agree that in order to produce ulcer occlusion of the local blood supply with ischemia is necessary. This condition may be brought about in a number of ways, in many instances being a result of spastic contractions of the pylorus. This shows that there is a pre-ulcer stage which is usually medical and that prophylaxis is of the greatest importance in preventing ulcer formation. The diagnosis of ulcer in this medical stage is extremely difficult but can be done with the necessary laboratory and X-ray aids.

Of 425 cases which were analyzed, 4 per cent had had a preceding infection, recent or remote; 65 per cent were constipated; 75 per cent were operated upon for something else which in all probability was ulcer; 50 per cent complained of pain, while in 83 per cent belching was a constant symptom. Pain occurred one or two hours after eating a light meal and three or four hours after a heavy meal. In the author's opinion, the pain is due to a tugging on the parietal peritoneum caused by the efforts of the stomach or duodenum to rid itself of a lesion. Of greater importance is the occurrence of tenderness, which was present in 8 per cent of this series. Tenderness in other organs must be eliminated however.

The chief value of gastric analysis is to afford an intelligent idea of proper dietetic treatment. As a diagnostic aid it is of secondary importance. The total contents of the stomach is of some value but is not as reliable as the raisin meal. Occult blood in the faeces is of great value providing other causes of a positive reaction can be eliminated. There is nothing in the urine to point to disease of the stomach or intestines, although the Cannonidge reaction has indicated a pancreatic lesion in several instances. The trypsin test is also of value in the diagnosis of the latter condition. The chief value of the blood count is in differentiating medical from surgical conditions. The diagnostic examination of greatest importance is the roentgenological. If an ulcer cannot be demonstrated in this manner it is probably not surgical. It is the one absolute method by which a medical ulcer may be differentiated from a surgical ulcer. Even copious hemorrhage is not a surgical indication unless the X-ray shows a defect. The absence of radiographic evidence of ulcer does not indicate the absence of ulcer but it does indicate the presence of a medical and not a surgical condition.

Differentiation between gastric and duodenal ulcer is important, the former going on to scar formation and obstruction and frequently cancer the latter usually to perforation. In the latter case if medical treatment is not quickly successful surgical treatment should be advised. E. K. ARMSTRONG.

Ochsner A. J. and Smithlee, F.: Benign Pyloric Stenosis and Its Management. *I. First. II. J.* 916 xiii 845

Of 8,581 patients with digestive disorders 698 were affected with some type of benign pyloric

stenosis. Definite proof of the nature and degree of the pyloric narrowing was possible at laparotomy or autopsy in 622 cases, or 89 plus per cent. The pyloric stenosis most commonly resulted from peptic ulcer duodenal or gastric.

In the order of their frequency other causes of pyloric stenosis were gall bladder disease and its complications, myomatoid hypertrophy of the pyloric and antral musculature, apparently consecutive to long maintained pyloric spasm, gastric syphilis, enlarged peripyloric lymph-glands, ailments of the pancreas (chronic inflammation, cyst, gumma) cirrhosis of the liver hepatic syphilis, hydronephrosis of the right kidney foreign body in the stomach gastric myoma, pyloric polyp, volvulus (1 faint) cyst of the liver pyloric varicosities, aneurism of the abdominal aorta.

The symptomatic features noted are as follows:

The characteristic of vomiting associated with pyloric stenosis is that when the diet is of moderate quantity and normal consistency emesis is a routine and generally a daily event.

Weight loss usually follows. In the series of cases it averaged 21 plus pounds.

3. Eructations, pyrosis, water-brash, and regurgitation were distressing enough to warrant special attention in 57 per cent.

4. Gross hemorrhage occurred in 31 per cent of the ulcer cases. Not rarely bleeding followed orcessive vomiting and retching.

5. Some form of abdominal discomfort was experienced by 93 per cent of the patients. When pyloric stenosis is associated with active, open, peptic ulcer the abdominal distress may be extreme.

6. Visible gastric peristalsis was a sign of diagnostic significance in rather more than 11 per cent of the cases.

7. Tenderness to pressure in the right, upper quadrant was noted in 79 per cent of the patients. It was most pronounced in instances where the causes of the stenosis were active or in perforating, peptic ulcer distended gall bladder or in inflammatory disease of the peripyloric glands or of the pancreas.

8. Palpable ridge or tumor occurred in 18 per cent of the patients. The value of the various clinical tests and medical treatment is discussed.

Surgical relief must provide several distinct conditions:

1. It must make it possible to carry a sufficient amount of food into the intestines to nourish the patient properly.

It must prevent the decomposition of food in the stomach which is due to retention.

3. It must permit the mixing of bile and pancreatic fluid with the food in a manner that will insure proper digestion.

4. It must provide conditions which will prevent the occurrence of regurgitant vomiting, commonly known as the "vicious circle."

5. The character of the operation must be such as not to cause a greater amount of shock than can

be borne by patients in the condition of bad nutrition in which they usually come into the hands of the surgeon.

6 It must provide a mechanism that will be permanently satisfactory from the physiological standpoint

In order to obtain an opening sufficient to carry the food from the stomach to the intestine, the posterior short loop gastro-enterostomy between the greater curvature of the stomach and the jejunum seems to have obtained permanent recognition. This operation should be performed with needle and thread. The opening should be at least 5 cm. in length and, in case the stomach has been enormously distended, it should be at least 7.5 cm. in length in order that when the stomach walls become contracted the passage may not be too small.

The location of this anastomosis should be made at the lowest point of the greater curvature as near the pylorus as possible because this will at once prevent regurgitation of bile into the stomach and it will prevent the tendency of the stomach contents to force its way through the contracted original pylorus.

In case the patient's strength warrants the additional manipulation necessary for closing the pyloric opening by section of the stomach at a point 1 to 2 cm. to the left of the pylorus, it is probable that this step is always indicated. If however the patient's strength does not seem to warrant it this step may be postponed until a later time when it can be performed with safety.

Whatever surgical treatment is given, however it is exceedingly important to give every patient carefully worked out, written instructions regarding diet and general mode of living not only during the period of convalescence, but for all time to come.

EDWARD L. CORNELL.

Homans, J : A Study of the Symptoms and Treatment of Congenital Transduodenal Bands.
Boston M & S J 1916 clixv 665.

Homans seeks to throw some light on the question whether transduodenal bands of congenital origin give rise to such symptoms as to cause them to be considered as a pathological entity.

The basis of the study is 11 cases. In the series there were 6 males and 5 females; the average age being 44 years with an average duration of symptoms of eight to nine years.

In regard to the symptoms it was observed that the general character of the patient's complaint tends to resemble that of ulcer or gall-bladder disease, but gives the impression of a reflex symptom complex.

In respect to intermittency the symptoms resemble gall-stones or chronic appendicitis rather than ulcer, being steadily present. Likewise in respect to food relief although when this is present it is more like the ulcer type.

In respect to vomiting the condition is rather like gastric ulcer or gall-stones.

Hematemesis was never noted.

Gastric analysis proved to be of no diagnostic value as results showed a wide range of variation.

The roentgen findings were very similar to those of duodenal ulcer. In 3 cases studied 3 showed duodenal defects, 2 dilatations of the upper duodenum, 1 hour glass stomach, 1 gastric hyperstalsis, and 1 atonic stomach.

In diagnosis only once or twice was the presence of a band suspected the usual diagnosis being duodenal or gastric ulcer and cholecystitis with stones.

The detailed findings and histories of the 11 cases together with several X ray pictures are given in the original.

The treatment as a rule consisted of division of the band and such other surgical procedures as were indicated—appendectomy etc. The author is inclined to favor Finney's pyloroplasty as a valuable adjunct.

From these facts Homans concludes as follows.

1 Congenital transduodenal bands may be responsible for symptoms reflex in type which have in spite of considerable divergence a definite family resemblance.

2 Accompanying these symptoms the roentgen findings very generally indicate duodenal spasm or dilatation of the first, or first and second, portion of the duodenum.

3 Division of the bands and appropriate treatment of raw surfaces is satisfactorily curative, but plastic operations to widen the opening into the duodenum probably give the best results.

4 Congenital transduodenal bands, judging from the frequency with which they are reported at autopsy are not necessarily pathologic, but may be responsible for digestive disturbances, having a recognizable symptomatology a prolonged course, and appropriate operative treatment.

P. M. CHASE.

Holden, W B : Mechanical Intestinal Obstruction.
Northwest Med 1916 xv 361.

The author reports briefly 43 operated cases of mechanical ileus, of which 36 recovered and 7 died a mortality of 16 1/2 per cent. There were 18 cases due to adhesions, 14 of these being postoperative, 5 cases of volvulus, 8 of cancer of the large bowel, 4 of intussusception and 8 of strangulated hernia. The fatal cases were as follows:

1 A male age 17 had had intestinal obstruction five days due to cancer of the descending colon. He was moribund, purged, and died six hours after a colostomy operation. The patient was moribund when first seen.

2 A man, aged 65 had a strangulated inguinal hernia of three days' standing. Resection of the bowel was done. He died, twenty-one days after the operation and ten days after returning to his home from gangrene of the lung following ether pneumonia. Autopsy revealed a perfect abdominal condition.

3 A woman aged 30 had been given *m*orphine and cathartics alternately for three days before she was referred to a surgeon. She died of toxæmia and peritonitis two days after operation.

4 A woman aged 35 had been given morphin for pain and repeated doses of cathartics including croton oil for five days. She was in a very weak enfeebled condition. The author saw her for the first time a half hour before operation. Three feet of badly damaged intestine was resected. She died of shock two hours after peritonitis. Too much surgery was attempted in this case. A simple enterostomy might have saved her notwithstanding the atrocious medical treatment.

5 A woman aged 60 with vulvula, was moribund and perished six days. She died 4 hours after operation of septic colitis.

6 A man aged 55 had cancer of the cecum which had caused partial obstruction for some weeks and absolute for two days. The cecum was resected and the ileum anastomosed to the sigmoid. The operation was done in a private house in the country under poor surroundings. The patient died three days after probably due to leakage at the line of sutures.

7 A woman aged 35 had cancer of the sigmoid with much glandular involvement. A short-circuiting operation was done but the patient died three days later.

These last two cases illustrate the futility of attempting extensive intestinal surgery in acute obstructive cancer of the large bowel. The immediate cause of death in these last two cancer cases can be attributed to surgery. Both could have been temporarily saved by simple colostomy. All the other five cases died because of delayed surgery.

EDWARD L. CURRIE.

McGlannan, A. Intussusception in Acute Intestinal Obstruction: Report of a Case Occurring with Round Worms. *South M J* 90 14, 977.

In a series of 16 cases of acute intestinal obstruction studied by McGlannan, 3 were due to intussusception.

The intussusception occurred at the ileocecal region 15 times in the small intestine 4 times in the large intestine once and at 2 different places in the small intestine once.

In 17 cases the etiology of the intussusception could not be determined. In 3 cases tumors of the intestine were present and in 8 cases there were intestinal worms. Six patients were under one year of age 5 between two and four 7 between six and eleven and the remaining 5 were between twenty-four and thirty-five.

The onset was sudden and marked by paroxysmal abdominal pain, associated with bloody mucous stools, a visible or palpable abdominal or rectal tumor vomiting and visible peristalsis. Later obstruction developed.

One patient was subjected to laparotomy.

Of 12 cases in which the invagination was reduced by intra-abdominal manipulation 2 died. Reduction with the tenotomy was done twice with one death resection with anastomosis 4 times, with one death resection with enterostomy once, resulting fatally. In two cases after manual reduction tumors were removed with recovery and once the bowel was opened for removal of worms death occurring sixteen hours later. All the fatalities occurred in children.

ALBERT ECKENHARD.

Satterlee, G. R. Chronic Intestinal Stasis. *Am. J. U.S.* 96 117.

Classification of intestinal toxæmia, according to symptomatology too indefinite so the author has adopted one according to the location or locations of the lesion. Neoplasms and unusual obstructions omitted. The following classification is submitted.

1 Gastric delay due to gastric atony after trap at the hind reflex causes.

2 Duodeojejunal obstructions, so frequently looked upon as a lenient form of intestinal toxæmia and believed by Lane and Bloodgood to be mechanical.

3 Ileocecal obstruction and non-obstructive ileal constipation.

4 Chronic appendicitis.

5 Cecal dilatation and constipation.

6 Atonic constipation of the colon, especially of the transverse portion. Under this head may also be grouped the dubious so-called spastic constipation.

7 Sigmoid constipation.

8 Lesions of the rectal outlet.

9 Complications of these forms.

A series of 36 cases was studied. Constipation as a primary or secondary complaint appears in 174 cases or 84 per cent. diarrhoea in 39 or 30 per cent, of which number 30 gave a history of both diarrhoea and constipation. In 5 or 3.5 per cent the history was unreliable, and in 8 or 6 per cent, the bowel movements were normal. Colica mucosa occurred in 59 or 43 per cent. flatulency to a marked degree in 104, or 66 per cent. Loss of weight occurred in 80, or 60 per cent. Mental symptoms, varying from simple inattention to melancolia and epilepsies, delirium, a delirium occurred in 54 or 40 per cent. Nerve symptoms neuralgias, etc. occurred in 88, or 65 per cent.

Motility is the cardinal point gained from the roentgen ray. The patient's intestine may be posited to any degree without causing any symptoms. Although enteroptosis was absent in only 30, or 22 per cent it was probably a strong predisposing factor in their illness, as shown by therapeutic results.

Gastric constipation is determined by remnants of the bismuth or barium meal six hours after ingestion. Delay on this basis occurred in 54 cases. In only one was organic obstruction apparent.

Ileal constipation shown by retardation in the terminal ileum, was present in 3 ileal obstruction by Lane. It was relieved by operation in 1 case.

Cecal constipation, of residual cecum, is determined by remnants of bismuth or barium in

the cæcum and oral part of the ascending colon forty-eight hours after ingestion. It was present in 57 or 42 per cent and was apparently responsible for much of the symptomatology in these patients.

Colonic delay was determined by the same method. A duration of between 48 and 72 hours in 13 or 95 per cent of 72 hours or over in 75 or over 50 per cent of the cases. In 15 or 11 per cent the colon was emptied in 24 hours.

Sigmoid constipation or residual sigmoid, was considered when the sigmoid flexure failed to empty at the end of three days. It was noted in 47 or 34.5 per cent and associated with residual cæcum in 22 or 16 per cent and was uncomplicated by constipation in other parts of the gastro-enteric tract in 8 cases, or 6 per cent.

The association of gastric cæcal, and sigmoid constipation was very instructive. Gastric constipation uncomplicated and due to elongated stomachs with a long pyloric arm (12 cm. or over) the so-called water trap stomach, was present in 7 or 5 per cent. "water trap" stomach with residue and intestinal adhesions in 3. "water trap" stomach with residue and obstruction in cæcum 2. "water trap" stomach with residue and cæcal constipation 7 or 5 per cent. "water trap" stomach with residue and sigmoid constipation 2. Residual stomach with no apparent anatomical abnormality and sigmoid constipation 2.

Gastric cæcal, and sigmoid constipation combined (normal types of stomach) occurred in 6 cases the same due to neuroses of known etiology in 2 cases gastric constipation with chronic appendicitis (proved at operation) in 5 or 3.7 per cent gastric constipation and ileocaecal obstruction 1 gastric constipation with perfect adhesions 2 cases.

Of the entire series 33 or 25 per cent had their appendices removed without lasting benefit to the chronic condition. There were 31 abdominal sections: appendectomy chronic or subacute 9 colon suspension 9 reconstruction of the colon 8 ileostomy 1 colon suspension, appendectomy cholecystectomy and adhesions 1 plication of cæcum 1 colon suspension and nephropexy 1 gastro-enterostomy and Lane's kink 1.

The author's observations upon the colonic vaccines have been significant both in differential diagnosis and in therapy. The vaccine is prepared in the usual way from the prevailing type of colon bacillus isolated from the patient's faeces. The dosage is of very great importance and injections should not be given when the bowel is loaded else an unnecessarily severe reaction is apt to result. The initial dose has been from 25,000, 000 to 50,000,000 continued at intervals from four to seven days the maximum dose being 300,000,000 bacilli.

EDWARD L. CORNELL.

Motley J. C. Appendicitis in Children. *J. Am. M. Ass.* 1919, 6, 12, 364.

In reviewing his case histories covering a period of five years, the author finds the records of 404

cases of appendicitis. Thirty-seven or approximately 9 per cent occurred in children of from 4 to 14 years of age. Of the 37 children 2 died following operation giving an operative mortality of 5.4 per cent. In addition to this one child entered the hospital in a moribund condition and died without operative interference and one is known to have died of general millary tuberculosis since leaving the hospital. The remaining 33 patients, so far as can be learned are living and well.

| Condition | CLASSIFICATION OF CASES | N. of cases |
|---|-----------------------------|-------------|
| Chronic simple appendicitis | | 6 |
| Chronic peritonitis following former drainage of feces | | |
| Solitary appendicitis | | |
| Tuberculous peritonitis | | 4 |
| Acute nonperforating appendicitis | | 4 |
| Acute suppurative perforating peritonitis with abscess | | 3 |
| Acute perforating appendicitis, with general diffuse peritonitis | | 3 |
| Total | | 27 |
| Condition | POSTOPERATIVE COMPLICATIONS | N. of cases |
| Pyloritis | | 6 |
| Secondary abdominal abscesses requiring secondary operations for drainage | | 4 |
| Postoperative pneumonia, toothache, and alveolar abscess | | |
| Postoperative obstruction | | |
| Cerebral embolism (?) | | |
| General millary tuberculosis | | |

The most constant symptom of acute appendicitis in children is leucocytosis. The average leucocyte count is 17,400 per cubic millimeter with an average polymorphonuclear count of 82 per cent.

There is a very significant frequency of perforative appendicitis following purgation. Of 19 cases in which the appendix had perforated when the patients were admitted to the hospital, 16 gave a positive history of having been freely purged.

There are several reasons for the high mortality in children. The early symptoms are not so clear cut and definite as in adults. The attack in children often follows dietary indiscretion and the parents naturally attribute the abdominal pain and nausea to an intestinal colic due to an overload of indigestible food. The violence of the symptoms is frequently not at all in proportion to the degree of appendiceal inflammation. Children as a rule are poor subjects for abdominal surgery; they withstand shock badly and hemorrhage worse. The child has much less blood than the adult and the loss of a comparatively small volume in the young subject will often prove fatal.

Early diagnosis and early operation seem to offer the best hope of reducing the mortality. If prompt operation is advised for adults it is much more important for children. There are many reasons for the endorsement of this as a sound surgical principle. Children are naturally restless; rebel against confinement to bed and restraint and generally take treatment badly. In addition to this when food is withheld from a child, an acidosis soon develops and this is often a troublesome complication. As a prophylaxis against this condition all children should be given glucose and soda, by bowel, after operation.

EDWARD L. CORNELL.

Blanes, I. Appendicitis; Study Based on 120 Interventions (Appendicitis estudio basado en 120 casos seguidos de intervenciones) *Rev. Asoc. Méd. Argent.* 9 6 xiv 60.

The author's summarized results based on 120 operations in cases of appendicitis are: (1) When seeking the cecum in the iliac fossa, always exteriorize the intestine, which is usually on the right side. (2) In an attack of appendicitis when after the beginning of the crisis there is cessation of the pains and then reappearance the appendix should be perforated. (3) When an appendicitis patient shows superior costal respiration the peritoneum may be inflamed. (4) Appendicitis cases with abdominal tumefaction and frequent and small pulse die under operation. (5) In appendicitis patients with a subicterus the prognosis is very grave. (6) The treatment of choice is intervention in the beginning of the disease. (7) The least mortality is obtained by the surgeon who operates with good technique as soon as the disease is diagnosed.

W. A. BRENNAN

Kinghorn H. M. Appendicitis and Pulmonary Tuberculosis. *J. Am. M. Ass.* 9 6 liii 84.

Appendicitis and intestinal tuberculosis are the two organic conditions in the intestines which are most frequently encountered in treating patients with pulmonary tuberculosis.

The majority of cases of appendicitis occurring in patients with pulmonary tuberculosis have the usual classical symptoms. There are several types of cases which are not classical and which can easily be overlooked. One is that type of case in which there are more or less chronic symptoms of intestinal indigestion. The symptoms may be hardly definite or severe enough to direct attention to the appendix, but examination may show that the symptoms are due to a chronic appendicitis.

Another type which is frequently encountered in tuberculous patients occurs as a mild appendicitis. The individual may complain of only a few cramps.

There is still another masked form of appendicitis which is emphasized by Deulafoy and which is occasionally seen in pulmonary cases. The onset of this form is by diarrhea. If the patient has abdominal pain and diarrhea, frequent physical examinations should be made of the abdomen in an attempt to find the seat of the pain.

From October 1905, to June 9 06 the author treated 77 patients with well established pulmonary tuberculosis. The total number of cases of appendicitis was 43 or 59 per cent. Of this number 29 were males and 14 females. As regards age, 4 cases occurred up to and including 30 years, 10 occurred between 30 and 39 years (excluding 30 and including 39), 2 between 39 and 40 years and 5 between 40 and 50 years.

Of the 43 patients with appendicitis 8 were operated on, 65 per cent, and 5 recovered without operation, 34 9 per cent. Of those who underwent operation, some were operated on during the

attack and others during the interval. Of those who did not undergo operation, the symptoms were so mild in character as not to demand operation.

Of the 38 patients who underwent operation, 3 or 10 7 per cent died. Two deaths occurred on the third day and one occurred four months following operation. Two cases had a complicating tuberculosis of the intestine.

Of the 38 patients who underwent operation, well defined tuberculosis of the appendix was found in 7—25 per cent. Of these patients 5 were in the moderately advanced and 2 in the far advanced stage of pulmonary tuberculosis. Tuberculosis of the appendix seems, therefore, to be present in the advanced stages of phthisis. None of the incipient cases showed evidence of tuberculosis in the appendix.

One would think not only that these patients would stand operation badly but also that the shock of the operation and the irritation of the anesthetic would have a bad effect on the disease in the lungs. The immediate danger from operation is slight and seems to be no greater than that which occurs with healthy persons.

A local anesthetic of epinephrin chloride and novocaine is to be preferred above all other anesthetics as it diminishes to a minimum the danger of shock and causes no irritation to the lungs. If local anesthesia cannot be employed, the combination of nitrous oxide and oxygen is the anesthetic of choice. Ether was given to three patients and none experienced any ill effects whatever on the lungs from this anesthetic.

When the appendicitis is mild or chronic, the pulmonary condition should be considered. When mild or chronic attacks occur in patients in good physical condition, a time for operation which is most suitable should be chosen. Many factors will influence the time.

When mild or chronic attacks occur in patients in feeble or poor physical condition, the question of operation should be decided only after careful consideration. Each case must be considered by itself. Such patients stand operation well. Should repeated attacks endanger their health or keep them from taking sufficient nourishment the appendix should be removed.

EDWARD L. CORDELL.

Koerbl, H. Sphincter Plastica in Incontinentia Alvi (Sphinkterplastik bei Incontinentia alvi). *Arch. f. Klin. Chir.* 9 6 crvii.

The basis of Koerbl's report concerns the case of a soldier with complete incontinentia alvi resulting from anatomic lesions of the external and internal sphincters due to gunshot injuries. Lesions of the sphincters often result in peace time from various traumas and even from obstetrical procedures, and Koerbl therefore thinks that his method of restoration of muscle function will have due indications.

Koerbl describes the anatomy and physiology of the sphincters and the mechanism by which their

injury causes incontinence. In incontinence where sphincter suture can be done it is undoubtedly the method of choice but in Koerbl's case the very large defect in the external sphincter (nearly half the circumference of the muscle) rendered direct suture impossible.

None of the operative methods hitherto employed in such defects — contraction of intestinal tube rectopexy etc. seemed to Koerbl to give satisfactory results because any improvement that results is mechanical only and although there may be continence of hard stools yet a physiological continence is in no way obtained.

The myoplastic operations of Shoemaker and Beresnegowski by which attempts have been made to train other muscles in the neighborhood of the intestine in substitution for the sphincters are unphysiologic, and their results have been very doubtful. They have value however in very extensive deficiencies or absence of the sphincters.

In view of the unsatisfactory outlook from such methods Koerbl's idea was if possible to restore the interrupted sphincterian function by plastic procedures on the sphincters themselves. Experiments made on the cadaver showed that this was possible. He therefore applied it on his patient. More than half of the circumference of the external sphincter was lacking the deeper parts being more involved than the superficial. Similarly more than half the circumference of the internal sphincter was lacking. After a previous contraction of the intestine it was found possible to grip the internal sphincter and join its separated ends with mattress sutures but a direct union of the external sphincter ends, particularly the part covering the internal sphincter was not possible. He therefore exposed the intact portion of the external sphincter by a perineal incision, and finding that the superficial muscular layers were distinctly separable with the vessels, from the deeper layers he easily obtained a strip of this surface about 6 cm. long this was pulled through the perineal incision under a preserved skin bridge to the defect in such a manner that the base of the flap lay at one end of the defect and its extremity at the other and it was thus sutured to the two stumps. The complete ring of the deep external sphincter was thus reformed.

Koerbl has not been able to find any case in the literature in which by cleavage of the sphincter layers, defects in the muscular ring have been restored.

The plastic procedures of Kehrer, Helferich and Billinger were different being in fact aimed at contraction of the sphincterian ring and not as in Koerbl's case in order to obtain a widening and reconstruction of it.

While the contractility of the external sphincter is governed by the hemorrhoidal inferior nerve, Koerbl is satisfied from his cadaver experiments that in separating the superficial from the deeper parts of the muscle only a few of the smaller nerve branches are destroyed. Similarly with the vascular supply.

The operation has been entirely successful but the occurrence of occasional diarrhea shows that although the internal sphincter is well supported by the suture of the external yet the functioning of the internal after its suture is not ideal.

W A BRENNAN

Smith R.: Some Observations Concerning Post operative Complications of the Lane Short Circuit and Colectomy *Surg. Gynec. & Obst.*, 1916 xliii, 539.

The results of the Lane procedure are too often spoiled by complications arising from the surgery itself.

In ileocolostomy impaction of the cecum necessitating secondary colectomy occurs in 20 per cent of Lane's cases. The remedy lies in assuring this content a free outlet after it has backed up. The fecal content in all successful short circuit cases backs up into the blind pocket and the only ones that become impacted are those with a partially obstructed colon from which the solid residue cannot return.

Short-circuiting around an obstructed colon is contraindicated.

Postoperative adhesions causing varying degrees of intestinal narrowing with secondary stasis are due to infection at the time of operation. The steps of the operation should be rearranged so that the abdominal contents are not exposed to infection after the colon has been opened and the sutures used in making the anastomosis handled. The technique of gastro-enterostomy in its comparatively sterile field cannot be safely used in the lower bowel. In colectomy alarming symptoms develop during convalescence on account of dehydration due to the sudden removal of the absorbing organ. Fluid should be given subcutaneously for a period of a week or ten days.

Careful selection of cases and careful selection of the type of operation for each case will prevent many postoperative complications, which have been attributed to the surgery itself. Ileocolostomy is designed to relieve a stasis in the ileum — the result of an obstruction. This has nothing to do with colon stasis or constipation. One should not expect to cure a mechanical difficulty in the large bowel with an operation designed only to relieve a mechanical difficulty in the small bowel. If a patient suffering from toxemia from the small bowel only becomes a surgical case, the author believes that the simple Lane short circuit is the operation of choice. If as is usually the case the obstructed ileum is accompanied by a dilated cecum, which has lost its power to empty itself normally the

Mayo right sided colectomy is in the author's opinion the operation of choice. The technique as developed in the Mayo Clinic, is free from the criticism of the Lane technique. In that the intestines are not handled after the colon has been opened, greatly lessening the possibility of infection and there is no blind pocket left to become impacted.

Drueck, C. J. The Diagnosis of Cancer of the Rectum. *Chic & M Recorder* 9 6 xxxviii, 637

Cancer in the rectum is the most fatal and sometimes one of the most painful diseases. Its exact cause is obscure. The large bowel contributes 95 per cent of all cancers of the intestinal canal and of these 80 per cent are in the rectum and 15 per cent in the colon. It is most frequent about 13 to 15 inches within the rectum the lower limit of the growth being about on a level with the internal sphincter. It is the most fatal in this location because of the rapid growth and the danger of obstruction. Not infrequently is the region about the anus. The different proportions of epithelial structure and stroma determine the degree of malignancy and also the physical characteristics.

Drueck differentiates a cerous ulceration from lupoid like plantar ulcer, simple atrophic ulcer, eczema, rodent ulcer and irritable ulcer or fissure.

He then discusses cancer above the sphincter within the rectum where the diagnosis is more perplexing. These belong to the columnar cell growths. The pathology of adenocarcinoma, cephaloid cancer, and scirrhous cancer is given. The cephaloid type grows rapidly and involves lymph nodes early thus making recurrence early and frequent. The adenoid colloid type is slow through degeneration of the deeper structures which become yellow with mucilage like material yellow but elastic speaking the softer the cancer mass the more rapid the growth with great malignant tendency. The cephaloid is the most malignant rectal tumor. The scirrhous type is the variety most frequently met with in the rectum. It rises through submucous entire time as a hard nodule beneath the normal mucous membrane and more frequently of the retroperitoneal wall blood vessels and nerves appear to be crushed out of the tumor resulting in little hemorrhage or pulmonary metastasis but as there is very little absorption of toxins the hexamethylenes late in the cancerous process with the rectum and its histological relationship not clear.

Cancer begins insidiously. If it begins below the middle of the intestinal sigmoid there is little pain, while if below the sphincter the cancer is painful. One of the first signs of trouble is a sense of fullness in the rectum, feeling as if something was retained in the rectum after the bowel has moved later pain with slight morning diarrhea or sometimes several evacuations of mixed feces and mucus. A sphincter becomes invaded there develops partial constipation which later becomes complete.

The ulceration of cancer that produces the fecal discharge are of two kinds, that below the sphincter and that of the growth itself. The former is usually of the scirrhous type while in cephaloid cancers the ulceration is of the second kind. In the cephaloid type the cancer degenerates as the growth spreads at the periphery and as the leucocytes

invasion occurs the rectum becomes shorter. This contracting and the associated loss of fat about the parts produces the funnel-shaped anus so pathognomonic of cancer. Blood and mucus is expelled in the presence of ulceration and is found in 90 per cent of all cases of cephaloid growth. Obstruction of the bowel is a variable symptom.

Digital examination is absolutely necessary. Every possible care must be taken in passing the finger through the stricture when it surrounds the rectum especially if near the peritoneal surface, for fear of tearing through the friable wall and entering the abdomen. Numerous cases of rupture and sudden death have resulted from carelessness in making examination.

A brief differential diagnosis is given between scirrhous cancer, congenital stricture, benign fibrous stricture, cephaloid cancer, syphilitic lesions including gumma and prolapsing proctitis.

CAR R. STREVEL.

LIVER, PANCREAS AND SPLEEN

Blanco, I. Abscess of the Liver (*Un caso del hígado*). *R. Soc. Med. B. A.* 96 xx, 70

The large mucous liver abscesses observed by Blanco were in patients who had lived in the tropics. It is possible that some relation exists between appendicitis and amoebian abscesses of the liver.

Blanco because the radiographic plates give better results than the most detailed examination of symptoms. On account of allowing change of position of the patient roentgen examination has advantages over the radiographic plate, the localization of the abscess.

Exploratory puncture is indicated in cases in which the roentgen examination is negative. In gaseous abscesses radiocopy allows the shaking fluid to be observed. The right lobe of the liver and its surface are the most frequent sites of an abscess.

W. A. BAXTER.

Narath, A. The Pathogenesis of Anemic Necrosis of the Liver After Ligation of the Hepatic Artery and Its Prophylaxis by Arterioportal Anastomosis. *Deut. Arch. Klin. Chir.* 9 6, 4

An article by Narath on ligation of the hepatic artery appeared in 1909 in which he criticized the clinical histories of the cases known up to that time, and gave the clinical history of a case operated upon by him. Since then other observations have been published and this present article Narath collects 20 cases of ligation of the hepatic artery done on the human subject. The matter was treated also experimentally by von Haberer in 1905 and by Nicoletti in 1906. The clinical and experimental conclusions arrived at are summed up thus:

Ligation of the common hepatic artery before the branching of the great collaterals does not cause disturbance owing to the facility with which collateral circulation is established.

2 Ligature of the hepatic artery proper i.e. between the pyloric and gastroduodenal emergencies, is permissible only in cases of necessity because it may give rise to small foci of hepatic necrosis.

3 Ligature of the hepatic artery beyond the pyloric and gastroduodenal emergencies is not permissible on account of the imminent danger of necrosis of the liver. Hence in the event of a wound of the artery at this point arterial suture or a prosthetic method must be adopted. An exception may be made in the case of aneurysm, which usually determines by degrees a collateral circulation, and on this account the danger of liver necrosis is minimized.

4 Ligature of either of the two hepatic branches of the artery is not permissible but may be done in an aneurysm of one or both branches, especially ligature of the left branch in the resection of the liver for tumor.

5 The foregoing refers to an artery with normal distribution. But varieties exist in which ligature of the hepatic can be executed without danger. Such varieties are recognized during the operative act.

6 In injuries to the artery if suture or arterial reconstitution is not possible the artery must be laced up in the injured part and not proximally so as to reduce the collateral circulation to the minimum.

Narath accepts all these conclusions, following his own personal experiences and seeks a method of preventing hepatic necrosis when ligature of the artery must be done in a place where danger may be feared. Solution of this problem is according to Narath to be found in arterioportal anastomosis, either a laterolateral or a terminolateral anastomosis. Numerous personal experiments are minutely described with the microscopic details of the changes suffered by the liver also the technique and the method to be followed in the human subject are outlined.

W A BROWN

Rehfuß M E.: Clinical Diagnosis of Gall Bladder
Penn M J 19 6 22, 66

Today in the study of gall-bladder disease we have not only the older methods of diagnosis (physical examination and clinical history) but through examination of the blood serum for changes in cholesterol content examination of the bile obtained directly from the duodenum and examination of the faeces more precise information can be obtained.

According to Chauffard the most important factor in stone formation is an increase in the cholesterol content of the serum. This occurs in two ways, exogenous by a cholesterol rich food diet and endogenous in which the suprarenals and corpora lutea play important roles. The latter he considers as a temporary cholesterologenic gland in that it can produce cholesterol and the former as the permanent gland. Not only is there an increase in the serum but there is a corresponding increase in the vesicular

bile. Further, it is believed that this cholesterol is eliminated by the liver-cell as cholic acid and according to Grigant it is this acid that combines with the taurina, glycochols, and bile-salts. Hence with an increase of cholesterol in the serum there is a decrease of bile-salts such is found to be the case in icterus.

In a series of 80 cases, 36 of which were proved cholelithiasis the author found a definite increase in serum cholesterol over the accepted normal figures of 16 to 18 gr per 100 ccm. of serum and in all gastro-intestinal conditions a universally normal or subnormal finding. In a second series there were several cases of stones where the findings were normal. This is explained by the fact that at the time of stone formation the cholesterol was increased but the latter fell to normal under a diet or disappearance of the other causative factors. Likewise there is quite a list of diseases such as nephritis, diabetes, syphilis, typhoid, cancer, tuberculosis, acute infectious diseases and others in which a cholesterol increase is found. These must be borne in mind in making a diagnosis.

Medically this indicates a cholesterol low diet i.e. poor in lipoids, fatty meats and fishes, eggs and certain vegetables such as peas and surgically removal of the gall bladder.

By the use of the Rehfuß tube the contents of the duodenum are aspirated and thus it is possible to obtain an uncontaminated specimen of bile for examination. The exact method for procedure is described in detail. In over 50 cases of gastrohepatic disorders the occurrence of turbid bile was rare. In ordinary cases of cholelithiasis with interval colic and no infection of the ducts pus is never found although micro-organisms may be grown. The opposite is true when signs of infection are present. Rehfuß believes that there is a change in the viscosity of the bile which may be measured by the drop method, and this may be of great advantage in infection of the ducts. It was also observed that the bile was always present no matter how deep the jaundice in cases with stones and never present in cases of neoplasm.

In examination of the faeces after a modified Schmidt diet the gross character, presence, and type of mucus, microscopical evidence of inflammation, blood and pus, character of meat digestion, the presence of neutral or combined fatty acids and total fat and evidences from the iodine reaction of undigested starches and the large organisms seen in deficient starch digestion are all noted. In complete duct obstruction the stools are acholic with an enormous increase in neutral fat. If only the bile-duct is blocked there is a great increase in split fats or fatty acids as well as the former.

In pancreatic insufficiency all three varieties of food stuffs show anomalies, while in hepatic insufficiency the fat digestion alone is disturbed.

Hemolytic jaundice and hypertrophic cirrhosis both show in spite of the jaundice the presence of bile in the duodenal contents and faeces.

In conclusion Rebuss states that

We have at our command in the study of gall-bladder disease three important methods of value apart from the data elicited in the history and physical examination namely the study of the blood serum from the standpoint of its cholesterol content, duodenal intubation, and an examination of the feces with a view toward noting particularly disturbances in bile elimination and fat digestion.

2 In the great majority of cases of cholelithiasis there is an increase of the cholesterol content of the serum which is of diagnostic importance and which is found in other conditions frequently mistaken for this disease.

3 The necessity of altering our conceptions of cholelithiasis is emphasized the treatment of gall bladder conditions in which stone is suspected a cholesterol low diet should be instituted.

4 Duodenal intubation is an important practical procedure which should be employed routinely in all gall-bladder cases and which in selected cases is capable of giving direct evidence of infection as well as information regarding pancreatic function.

5 A microchemical study of the feces is to be made in every case with special reference to disturbances in fat digestion which are usually met with in gall-bladder disease.

6 In arriving at a diagnosis all data should be correlated and if necessary an analysis of other organs can be made so as to rule out conditions presenting a similar symptomatology P M CRANE

Nichols, H J Experimental Observations on the Pathogenesis of Gall Bladder Infections in Typhoid Cholera, and Dysentery *J Exp Med* 9 6, xii 497

The author refers to the fact that the chronic carrier in the typhoid group of diseases as a result of infection is becoming of more and more importance in epidemiology In most cases the micro-organisms are known to be carried in the gall bladder or gall passages and in cholera the infection seems to produce nearly the same result At least semichronic intestinal carriers have been found the author states, and their occurrence has been shown by various authors to be due to infection of the gall-bladder so that Nichols believes that in this whole group of diseases one of the most important problems of preventive medicine seems to be the prevention and cure of gall-bladder and gall passage infections.

He alludes to the fact that the subject has already been approached from the experimental standpoint The present paper however deals with experimental observations on the mechanism of gall-bladder infection in typhoid, concerning which our knowledge at present is still uncertain the mechanism of infection in cholera and dysentery by a portal system septicemia is suggested, and the antiseptic properties of rabbit bile are emphasized

The results of the experiments recorded in this study support the theory of descending infection of

the gall-bladder through the bile from the liver Nichols believes that infection of the gall-bladder wall cannot be absolutely ruled out and probably occurs at times, but the bile-ducts seem to be the regular avenue of infection This conclusion suggests to the author that prophylactic measures and possibly curative measures should be directed toward the bile rather than toward the blood stream and tissues Vaccination for example he states, appears to have little effect in the prevention and cure of experimental or clinical lesions and in fact may favor the production of lesions by increased elimination of organisms in the bile A great deal of experimental work has been done with various drugs and synthetic substances the author notes, but the subject of the natural defences of the bile and the possibility of increasing them has been neglected He believes that human bile must have some antiseptic action because, in any septicemia, some micro-organisms undoubtedly pass through the bile ducts and gall-bladder but in only a comparatively few cases do they produce a definite cholecystitis If states some specimens of human bile are bactericidal or inhibitive *in vitro* while others are not

From his study the author concludes that the theory of the production of gall-bladder lesions in typhoid by descending infection of the bile from the liver receives support from investigations with the common duct fistula method in the rabbit More bacilli appear in the bile with increased doses, he states and more gall bladder infections are obtained by increased doses More bacilli appear in the bile after mesenteric vein injection than after ear vein injection and more lesions result under the first condition More bacilli appear in the bile after injection of the same dose in immunized animals than in normal animals and more lesions also result in immunized animals In cholera and dysentery he states, the same mechanism is suggested with the additional factor of a portal system septicemia

After the appearance of micro-organisms in rabbit bile their fate is apparently largely determined by the antiseptic properties of the bile the author believes, and 100 per cent infections cannot be secured by intravenous doses large enough to insure the presence of micro-organisms in the bile Rabbit bile *in vitro* may be antiseptic to the micro-organisms considered, and the antiseptic action is largely due to its alkalinity

It seemed apparently possible to the author to protect the rabbit to some degree against gall-bladder infection by a previous injection of sodium bicarbonate, and he suggests alkaline therapy in the prevention and cure of gall-bladder carriers

GEORGE E. BRUNY

Roman D Surgery of the Gall Bladder *Hahnemann. M* 18 9 6 B, 830

The last twenty years have brought notable advancement in the knowledge, by diagnosis and treat

ment, of gall-bladder lesions mainly through surgery and its associated means of clinical research.

In formulating his judgment as regards the surgical aspects of gall bladder diseases the author has been influenced by a study of certain factors in the histories, operative findings and results in his experience with 2,000 operations for lesions of the liver, gall bladder, bile channels, and pancreas.

When infection from nearby or from remote sources is the etiologic factor, whether reaching the bile channels through the blood or the lymphatic stream or by extension and contiguity of structure from near by inflammatory foci, the septic process in the bile channels will, sooner or later, determine a lesion in the gall-bladder and bile-ducts essentially and, from beginning to end, surgical. A septic gall bladder, once recognized, should come under surgical supervision.

Roman believes that pain in the upper right quadrant of the abdomen should be less and less attributed to indigestion, torpid liver and dyspepsia, and lead more and more to a closer and earlier study of each individual case upon a basis of differential inquiry into the most common lesion of the upper abdomen.

Since the earliest history of gall bladder surgery, the case history and physical findings have played a most important rôle in the diagnosis of these lesions. We all know how frequently we encounter in abdominal surgery gall-stones without symptoms and symptoms without gall stones. With all this uncertainty, however, there is probably no other surgical condition in which the case history is more essential to diagnostic conclusion than in gall bladder disease.

The author reviews briefly the histories of two recent cases of cholelithiasis, in which he operated in the face of the most negative clinical factors. In the first, the history was obscure and the physical findings undependable, while operation was justified on the grounds of long continued distress and gastric disorder without relief under medical treatment. The second brings forth the lesson that case histories, as obtained by hospital internes and laboratory reports in the clinical study of cases, may prove misleading, even cases with clear landmarks for diagnostic judgment.

The author believes that a carefully obtained history, concise, clear and accurate, has been of greater aid in the diagnosis in gall bladder disease than any other diagnostic data.

He considers it more intricate and perplexing to make a diagnosis in chronic cholecystitis without stones, when the signs and symptoms are less prominent even when the abdomen is opened, the gall-bladder with much affected mucous membrane may show little or no change in the external appearance and condition of the outer coats.

Infection may be either ascending or descending and occur without the presence of gall-stones, leading also to various changes in the gall bladder.

The most frequent symptom of gall-stone disease

is biliary colic. Its production depends upon the free entrance of bile into the gall bladder with sudden temporary interference in its discharge into the common duct by a stoppage either by rolling stones or by other obstruction.

When the gall bladder becomes entirely filled with gall stones, bile sand or inspissated bile and mucus the patient may never experience biliary colic. It is the rolling stones or other movable obstructions that usually cause colic. In infections with gall-stones or without which are allowed to advance until the liver, pancreas and the neighboring lymph-glands become involved in the infection with adhesions and structural changes, the operative mortality is high by virtue of delay and collateral complications, and extensions of septic processes, so that the gravity of surgical interference is entirely dependent upon and in direct ratio to early or late operation.

The author believes that the knowledge of chronicity of biliary disease, the anatomical relationship of appendiceal and intestinal infections to the bile channels and metastatic routes to the pancreas, links into closer interdependence three pathologic entities which should be borne in mind by the general practitioner and by the family physician in dealing even with the mildest or most transient symptoms which are referred to the upper abdomen, providing these symptoms show a tendency to persistency or to recurrence.

Cancer of the gall bladder is held out to the physician and to the laity as an unpardonable result of neglect of cases which, during the best years of their lives, manifested gross physical symptoms and evidences of progressive biliary disorders. If an early operation in the early stages of gall-bladder disease necessarily confronts the surgeon with doubts as to his judgment because of absence of gross evidence of gall bladder disease, and his exploring hand finds no enlarged chain along the common and cystic ducts, no evidence of cholecystitis, pancreatitis nor adhesions, no pyloric or duodenal ulcers, he may not yet be in error for the gall bladder mucosa may be diseased in some small area only and drainage be justified and a cure obtained.

The incision and the manner of approaching the field of operation is unimportant. It is a matter of individual preference with the operator. The author prefers Kehr's bayonet incision personally, with slight modifications as it gives exposure and facility in surgery of the bile-ducts. He believes that we have clean-cut indications of the choice of cholecystotomy or of cholecystectomy with odds in favor of the latter. Roman performs cholecystectomy himself whenever feasible, inside the margin of safety.

E. C. ROBINETTE.

Fowler R. S.: Cholelithiasis. *Cyst. Ann. Surg. Phila.* 1916, liv, 546.

Idiopathic cholelithiasis formation is an extremely rare anomaly of congenital origin. Kehr in 1915 reported the number of cases in the entire

literature to be 9. The enlargement is most marked in the middle and upper portion of the common duct. Rostowzew suggests that they are the result of an angulation of the duct at its entrance into the duodenum with an interference with the direct flow of the bile into the duodenum. Most of the cases die in childhood from cholangitis.

The author reports one case in a man twenty two years old in which careful examination failed to reveal the presence of common duct stone. The symptoms were those of acute cholecystitis and cholangitis. The common duct was the size of a large orange while the gall bladder and cystic duct were enlarged. G. TILWOOD

Araya R. Surgical Observations upon Biliary Lithiasis and Its Treatment (Consideraciones quirurgicas sobre la litiasis biliar y su tratamiento). *R. Soc. Med. P. R.* 96: 111.

Araya thinks that neither clinical data nor the most minute examination of the patient will permit pre-operative determination of the surgical treatment which must be followed in biliary lithiasis cases. Extirpation or preservation of the gall bladder must rest principally on the anatomopathologic condition of its walls and hence on its ulterior functional capacity. Infection of the reservoir is not a sufficient reason for extirpation or preservation of the organ, except in cases of acute infection with high temperature, etc.

Cholecystostomy should be the intervention of urgency. Large incisions of the abdominal wall are as a rule unnecessary in intervention of the biliary apparatus, since with the Elliot position and Robson's eversion manipulation cases can always be operated through incisions of 7 to 8 cm. Jalaguier's incision is preferable to all others because it offers the best guarantee against future eversion. The transareolar method of Mayo-Robson with oblique, superior and inferior prolongations are required only in cases where a wide operative field is necessary (occlusion of the common duct, acute pericholecystitis, etc.). Sumner's adaptation of the tobacco-pouch suture to cholecystostomy offers the best safeguard against the effusion of bile into the peritoneum, it limits the aperture necessary for fistulization, avoids in the generality of cases the placing of drains, and facilitates the adaptation of the edges of the vesicular wound.

Interposition of the transverse colon fixed to the anterior wall between the bile passages and the rest of the abdominal cavity is necessary whenever the denudation of the peritoneal superficies of the vesicle causes the fear of production of new adhesions or when there is reason to fear peritoneal infection.

Doyen's cholecystectomy is the ideal treatment for this intervention and should always be done if possible. Choledochotomy with preservation or extirpation of the biliary vesicle is the only method which should be employed in calculous occlusions of the choledochus. Permanent deviation of the bile to the exterior or to the intestine by an artificial

outlet should be an exceptional procedure in biliary lithiasis, and should be used only in cases in which a definite and insurmountable obstacle does not permit of a radical operation. W. A. BARNARD.

Kono Primary Cancer of the Pancreas. *J. M. Soc. Kyoto*, 96: 111, 3.

In 352 cases of cancer treated by the author he has observed 12 cases of cancer of the pancreas in patients above 45 years except one case in a woman of 33. Nine of the cases were in men three in women.

With regard to the situation of the tumor in 8 cases it was at the head of the pancreas, in the body in one and in the tail in 3 cases.

The adenous type was predominant. In some cases the medullary and colloid types were observed. Histologically adenocarcinomata were habitually found with very notable mucous formation. Epithelioma was found in two cases flattened and squamous epithelium resulted from metaplasia of the cylindrical epithelium because an apparent transition state between the two was observed. In one of the cases the author is convinced that the modification was produced by chronic irritation of the pancreatic canal by the *Cl. orchis sinensis* and that malignant transformation resulted.

Evident cirrhotic alterations were frequently found in the parts of the pancreas not invaded by cancer. All the neighboring interstitial tissues were in a state of irritation. Glycosuria was noted in one case only and in this case the pancreas was so completely destroyed that it was impossible to determine the origin of the tumor.

Icterus was the predominant symptom in the majority of the cases. W. A. BARNARD.

MISCELLANEOUS

Brunzel, H. F. Contribution to the Knowledge of Hernia Pectinea. Also a Case of Cured Obturator Hernia (*Hernia pectinea nebst einem Fall von geh. obturatorius hernia*). *Arch. f. Klin. Chir.* 96: 111, 47.

Hernia pectinea has been considered by the older writers only as a more or less distinct and typical form of crural hernia. But Harzbecker who recently studied it, insists that it is a hernia sui generis. The hernial sac is always embedded beneath the fascia pectinea and more or less in the pectineus muscle and is therefore a layer deeper than a femoral hernia. The hernia protrudes outward beneath Poupert's ligament in front of the horizontal ramus of the os pubis, escaping through a breach in the ligament in Gimbernat's.

Brunzel reports 3 cases of hernia. The first was in a woman of 63 and was diagnosed as a hernia pectinea before operation. After the usual femoral hernia transverse incision a small femoral hernia was disclosed. This contained the lower part of the cecum. The fascia pectinea was then exposed. Beneath the fascia and medial to the hernia

femoralis a long light tumor could be distinctly felt.

On incising the fascia the tumor was easily removed from its muscular bed in the pectineum, and it proved to be a hernia pectinea containing clear exudate and the oedematous appendix. The hernia pectinea was distinct and separate from the femoral hernia, the former having erupted through the ligamentum Gimbernati in such a way that there was a distinct septum between the two herniae and their points of departure. It seemed as though the hernia pectinea had erupted first through the breach of the femoral hernia and then burrowed its way beneath the fascia pectinea.

The appendix was removed and the caecum replaced and both sacs ligated with plastic closure of the breach. The patient made a normal recovery. Thus in this case there were two distinctly separate hernial sacs, the smaller having all the characteristics of a femoral hernia and breaking through the crural

ring the second breaking through the ligamentum Gimbernati pushing under the fascia pectinea and resting on the pectineus muscle itself. This latter therefore is a typical hernia pectinea.

In the second case there was no diagnosis of hernia before operation, all the symptoms pointing to an intestinal occlusion. Laparotomy showed that about 20 cm. above the caecum the small intestine disappeared in a hernial sac which led beneath the ramus of the os pubis and laterally from the symphysis. After traction this was exposed and found to be a true hernia obturatoria. About 5 to 6 cm. of the intestine was incarcerated. The sac was sutured and the patient made an uneventful recovery. Brunzel points out that in this case the patient's recovery was due less to the means at disposal of diagnosing and recognizing a hernia obturatoria than to the fortunate fact that the intestine had not perforated and could be restored to its normal position.

W. A. BRENNAN

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Patterson R. G. Fatal Hemorrhage in Bone Tuberculosis. *Am J Orth. Surg.* 1916 xiv 607

The author reports a case with autopsy findings. He thinks the infrequency of hemorrhage in bone is due to the fact that the arteries are end arteries, therefore not forming anastomoses, and to the fact that the bone being a resistant tissue when an inflammatory exudate does occur as in the case of collateral inflammation the vessels are closed by pressure.

In the case reported the tuberculous process extended probably into the internal mammary vessels, causing fatal hemorrhage. The patient had multiple foci of infection. There was infection of the lungs, hand, elbows, wrist, and knee, foot and sternum. Profuse hemorrhage occurred from the sternal sinus and in five hours the patient was dead.

PHILIP LEWIN

Prince, H. L. Giant-Cell Tumor of the Os Calcis. *Am J Orth. Surg.* 1916 xiv 641

The author believes the evidence points to the true tumor character of giant-cell tumors. They occur most frequently in the long bones and the jaw. They may appear in the short bones. The age incidence is generally between 20 and 30 years.

The diagnosis can usually be made by the history and the roentgenologic study. The condition is benign. The treatment consists of thorough, careful local removal with cauterization by carbolic

acid followed by alcohol. Whether bone-grafts are indicated depends upon the circumstances to be met usually they are not needed. Local recurrence should not discourage one in the use of the treatment nor lead to amputation.

The author reports two cases of giant-cell tumor of the os calcis with operation. In both there was a fairly distinct history of trauma. The rate of growth was constant. After three years' duration the os calcis in each case was entirely occupied by the tumor. The symptoms in both cases were intermittent periods of pain, swelling and limping.

PHILIP LEWIN

Thompson W. G. Inoperable Peripheral Gangrene. *Med. Rec.* 1916 xc, 1 3

The author has used constant dry heat with good results in the treatment of moist gangrene in cases where intercurrent disease or refusal of the patient prevents operation. The heat is supplied by a stream of air at about 150° F. blown over an electric toaster or a Bunsen burner. The part is soon mummified, pain is decreased and odor disappears. Surprising results through natural healing or spontaneous amputation are sometimes seen. Deep sloughs which cannot be reached by the hot air are kept saturated with 95 per cent alcohol.

Attention is called to the sources of gangrene. Gangrene of the superficial regions frequently occurs in the severe acute contagions and infections such as malignant scarlatina, variola, mumps, typhus and diphtheria. Trophic nerve lesions such as Raynaud's disease, embolism, as for instance from ulcerative endocarditis and diabetes are given as important origins. Out of 38 cases due to medical causes 10 were from arteriosclerosis, 11 from

diabetes. The gangrene of diabetes is not necessarily an immediate precursor of death as is shown by several case histories. W. A. CLARK.

Bousquet. Piece of Shell Free in the Right Knee-Joint for Five Months; No Trace of Infection. *Extraction of the Foreign Body (Eclat d'obus libre dans l'articulation d genou droit depuis cinq mois - une trace d'infection extraction d corps étranger)* *Presse méd.* 9 6 p 558.

A soldier was wounded in the thigh in April, 1916. Two pieces of shell entered by the same orifice one of these was extracted the other remained unperceived. The man entered the hospital again in September on account of a swollen knee. Radiologic examinations showed a piece free probably in the knee-joint. This was removed and the man recovered. This case reported in order to show that all shell wounds are not necessarily septic wounds. If a piece of shell should enter a region impossible or extremely difficult of access, there is still a chance of escaping infection and of the foreign body being tolerated. W. A. BRECKMAN.

Derach. Six Cases of Knee Wounds, Treated by Excision of Necrotic Tissue, Immediate Articular Disinfection. Followed by Primary Suture of Capsule and Early Mobilization of the Articulation. (Six cas de plaies du genou, traitées par l'excision des tissus nécrotiques, la désinfection articulaire immédiate suivie de suture primitive de la capsule et de la mobilisation précoce de l'articulation.) *Bull. et mém. Soc. de chir. de Par.* 9 6 III 337.

Derache has 6 cases of knee wounds treated by immediate excision of contused and contaminated tissues followed by primary suture in case of dislocation to the Carrel method which makes first a chemical disinfection of the wound trajectory followed by secondary suture when bacteriological examination shows that the wound is aseptic. The treatment has given a simple and rapid recovery and a total functional recovery of the articulation.

Derache's report was submitted by Maucclair who pointed out that these results were quite in agreement with those reported by others who had adopted this method of treatment. Thus Loubat in 3 cases had obtained reunion *per primam* in 22 Sencert out of 22 Duval 8 out of 19. Loubat and Duval have reported complete functional restoration in all their operated cases. Leroy in 6 out of 7 and Sencert in 9 out of 10.

Such excellent results are due to the fact that primary surgical disinfection of the wound obviates infectious arthritis with the complications arising from it which bring about fibrous or osseous ankylosis.

The method while applicable to all articulations is very difficult in cases of ankle and hip-joint injuries and in cases of the knee joint it is confined to those without extensive bony lesions.

W. A. BRECKMAN

Duval, P. Treatment of War Injuries of the Knee, Without Osseous Lesions or with Intra-articular Fractures, by Wide and Systematic Arthrotomy and Total Closure of the Articulation. (Traitement des plaies de guerre d genou sans lésions osseuses ou avec fractures intra-articulaires, grande incision exceptée, par l'arthrotomie large systématique et la fermeture totale de l'articulation.) *Bull. et mém. Soc. de chir. de Par.* 19 6, XII.

Duval's observations are based on 19 knee injuries which he treated in his ambulance service during one month. The injuries were simple, synovial wounds without bone involvement or articulation injuries with only slight osseous injury. The treatment was by wide arthrotomy, V-lateral section of rotulan tendon at its middle third, section of the two rotulan attachments, removal of projectiles and débris, compression of the synovial and plentiful ether lavage. If there are bone injuries they are curetted preserving any fragments attached to the condyles. The entry and outlet orifices are widely incised and then sutured. The articulation is completed, closed by two-stage sutures and the limb encased in plaster.

The results gave 18 recoveries. Of the 19 injuries 7 were simple and all recovered. The other 12 had bone injuries and these gave 11 recoveries. In 5 of the recovered cases the functioning is excellent in the other 3 cases sufficient time has not elapsed to make a definite statement.

Duval thinks that the procedure permits exploration of the whole articulation and systematic ablation of foreign bodies either intra-articular or intra-epiphyseal. Moreover he thinks that recent articular wounds treated promptly do not require drainage and that immediate resection should be limited to very extensive ruptures where conservation is impossible. Immediate resection in view of the possibility of future infection must yield when possible to aseptic articular surgery with a conservative basis.

W. A. BRECKMAN.

FRACTURES AND DISLOCATIONS

Lund, P. B. The Parham and Martin Band in Oblique Fractures; Remarks upon Mechanical Appliances Versus Bone-Grafts. *Surg. Gynec. & Obst.* 9 6 XIII 545.

The advantages of the operative treatment of fractures are (1) that it gives more accurate apposition of the fragments (2) the after treatment is shorter and simpler (3) the end-results are more perfect. These advantages are especially marked in fractures of the femur where the ease of the after treatment in the operative cases contrasts with the long-continued and difficult extension methods. Transverse fractures of the long bones are best treated with plates and screws, oblique fractures by some form of encircling wire or band. Of these, the best is the band of Parham and Martin. It is broad enough so that it does not cut in, strong enough to resist the most violent pressure, and simple of application. Fixation is aided by the crowd-

ing together of the roughly fractured oblique surfaces. Union takes place more quickly in oblique fractures which are banded than in transverse fractures which are plated. A very large proportion of fractures of the long bones demanding operative treatment are more or less oblique, and therefore may be treated by the band.

By the use of two bands spiral fractures with comminution may be very well managed. As compared with bone-graft, the use of the band is comparatively simple. The author has used the bands in fourteen cases of fracture of the femur and nine of fracture of the tibia.

In children the band does not interfere with the growth of the bone, but the bone grows over it and includes it. This has been demonstrated by the X-ray. The application of the band is simpler than the inlay bone-graft in fracture of the femur.

Jones, R.: The Mechanical Treatment of Fractures Under War Conditions. *Brit M J.*, 1916 II, 839

The methods employed for handling fractures under war conditions must be both effective and simple. Access to the wound must be easy and painless and immobilization of the part must be assured. Plaster-of-Paris dressings are condemned in the presence of open wounds, as the plaster absorbs the discharges, becoming offensive and adding to the wound infection.

For fractures of the lower spine and pelvis the double Thomas frame is used if there is a wound on the posterior surface that requires dressing the padded portion of the frame can be shaped accordingly to allow of access.

Intra- and extracapsular fractures of the femur are treated by a modification of the Thomas splint which allows of abduction of the injured limb. Both limbs are held under control, and extension of the fractured limb is secured by adhesive strapping and tapes which are secured to the lower part of the frame. Counterextension is maintained by a smooth leather groin strap on the opposite side of the frame. The splint is so constructed that the patient may be prepared for transport with both limbs parallel and as soon as he arrives at the hospital the limb is abducted without disturbing him in any other way. For all other fractures of the thigh the Thomas knee-splint is considered by Jones to be the simplest and best. Fractures of the lower portion of the tibia and fibula and those through the ankle-joint are treated by a skeleton splint which extends above the knee and has a right angle foot piece.

Fractures through the shoulder joint and through the surgical neck of the humerus require no splints. The elbow should be slung at right angles and fixed by a broad bandage to the side. The dressings will probably replace the usual pad in the axilla, which should never be bulky. Where practicable the patient should be treated in the upright position and should have his head and shoulders well propped at night. Where from the nature of the injury

ankylosis is to be expected, the arm should be kept abducted slightly forward, and slightly rotated inward with the forearm flexed well above at a right angle. Fractures of the middle and lower middle portions of the humerus are treated by the modified Thomas knee-splint or by a modified Thomas humerus extension splint. In the treatment of fractures of one or both bones of the forearm the position of supination must invariably be maintained. All injuries of the wrist joint should be treated in the dorsiflexed position in order that the fingers may maintain their grasping power. R. B. COFIELD

Collier F. A.: Fractures in a Base Hospital. *Boston M & S J.* 1916 clxxv 741

The author's paper is based upon the records of the American Women's War Hospital, a typical base hospital where 1,514 surgical cases were treated in the course of nineteen months. Of these cases there were 310 with fractures of one or more bones, the cases with fractures thus roughly comprising about one fifth of all the surgical cases. A number of these cases presented more than one fracture problem, making a total of 327 fractures requiring treatment. Of these 327 fractures 40 were simple and 287 compound, the latter caused by a missile of warfare in every case. In the 287 compound fractures there were 44 in which healing took place without infection and 243 cases with sepsis of varying grades present. Of the infected cases, 238 were pyogenic infections caused by the staphylococcus streptococcus, in many cases of an attenuated variety bacillus pyocyaneus and members of the colon group. In the majority of the pyogenic infections the sepsis was of a low-grade nature with a tendency to become chronic, with indolent granulations and sinus formation. There were only 5 cases from which bacillus perfringens was isolated. In this series it was found that the degree and amount of sepsis were dependent upon the character of the wound, the conditions under which it was received and on the missile causing it, rather than on the character of the first dressing or the time when it was applied.

As regards the treatment of bone fragments, the author has become more and more conservative about their removal. Fine fragments, loose in the tissues and bearing no relation to the correct alignment of the bone are removed. Larger loose fragments, from which the periosteum has been stripped are also removed, but all other fragments that have at least a partial periosteal covering and any muscular attachment are pushed back into relationship with the line of the principal fragments. If any sharp spicules are present on fragments adjacent to vessels, they are cut away. Occasionally the small fragments extrude themselves later or their removal becomes necessary, but in case after case one may see callus formation greatly assisted by proliferation from these small fragments, and in several cases a pronounced gap was entirely filled in by bony growth from them. The viability of

these fragments depends a great deal on the virulence of the infection but that they will live and proliferate in the presence of pronounced sepsis there is no doubt. It would seem that these severely comminuted fractures offer particularly favorable conditions for early and solid union, since it has been shown by Macewen that the osteogenic power of bone varies inversely with its volume.

For drainage rubber or gutta-percha strips were used in all cases, and in addition a soft rubber tube of small caliber for irrigation and for instillations of hypochlorous acid after the method of Carrel and Dakin. All drains were shortened and removed as early as possible, as it was found their prolonged use favored the formation of sinuses. In wounds with large open areas secondary suture was performed as soon as possible, to minimize scar formation and disabling contractures.

As to the use of bone-plates the author believes that there are a certain few septic open fractures in which the use of the bone-plate is justifiable. The plates undoubtedly do retard or inhibit callus formation at their site consequently they should be removed as soon as there is enough callus present to fix the bone ends in position. One of the cases proved most instructive showing clearly the absence of regeneration around the bone-plate. The specimen obtained showed a firm symmetric callus with firm union except at the site of the plate, and for 1 cm. on all sides there was total absence of all callus, with devitalized bone present at this point alone.

The later removal of extruded fragments which had become necrotic from the trauma of the injury is the comparatively small price one pays for the conservative treatment of comminuted fragments. Of the 243 cases with infected fractures, operation for the removal of sequestra was found necessary in 115 or in nearly 50 per cent and often multiple operations were performed for this purpose. In discriminate and vigorous curetting of these areas often caused the formation of distressing cavities, very hard to close in and infection of healthy bone. Often primary union was obtained after excision of the sinus, removal of sequestra and sterilization of the cavity.

Of 2 cases of delayed union, was treated by injection of blood into the callus, and firm union was present six weeks later. The second was treated by friction made between the fragments and union soon took place. Inlay bone-grafts were used in a few cases with complete success, after failure of plates and especially to span gaps. Before performing a clean corrective operation on bone the author waited until three months after the sepsis had disappeared.

As to other complications, there were 3 cases of secondary hemorrhage and 8 cases of serious nerve injury brachial plexus, musculospiral (3) peroneal (1) median, radial. Fractures in joints were frequent and usually attended by disabling and dis-

appointing results. Aside from the ankylosis following this type of injury there were some due to other causes. The author found that the most useful shoulder for a man who must do manual work resulted from ankylosis at about 45 degrees from the body this giving the greatest range of scapular motion, the arm inclining slightly forward from the perpendicular. The majority of cases were invalidated because of lesions involving the joints, hence the great opportunities for orthopedic work.

P. G. SULLIVAN, JR.

Lawrence, W. S. A Mechanical Traction Device for the Reduction of Fractures of the Forearm, with the Aid of the Fluoroscope. *Intern. M. J.* 9 6 xxii, 155

Lawrence presents a device for producing and maintaining powerful traction in reduction of fracture of one or both bones of the forearm. Two parallel uprights 7 inches apart placed along the outer and inner borders of the forearm are connected by a cross bar distal to the hand, from which an adjustable screw passes between the middle and ring fingers to another cross-piece that is held in the palm of the hand by having the fingers closed in flexion by a bandage. Above with the elbow at a right angle countertraction is obtained by a padded, molded splint of wood which is fastened in front of the biceps by straps just above the elbow and fitted to the upper end of the uprights.

Extension is obtained by turning the winged nut at the lower cross-piece. By means of the fluoroscope the bones may be adjusted while traction is maintained and the splint dressing applied.

RD EXT G PACKARD

Sappington, C. F. Fractures Involving the Elbow-Joint. *J. Am. Med. Assoc.* 9 6 ix, 549.

Sappington enumerates the following types of elbow joint fractures with a description of their respective etiology and pathology supracondylar, diaphyseal, external condyle, separation of entire lower epiphysis, intercondylar T or Y olecranon process, trochlea, head of radius, epitrochlea, capitellum, and coronoid process.

In treatment of fracture of the lower end of the humerus the author extends the forearm under anesthesia, makes traction while trying to mold the fragments, and then hyperflexes the forearm, and holds it by the dressing described by Ashhurst. By this method the forearm, inclining slightly in cubitus valgus, is in acute flexion as is possible without arresting the pulse or causing Volkmann's paralysis. The hand of the injured limb can frequently be brought to the same side of the neck, and the bandage applied holds the wrist firmly to the arm, suspends it from the neck, and covers the elbow but does not fasten the limb to the chest. This position is maintained for over two weeks, after which the flexion is gradually diminished until at four weeks the extension has reached 90 degrees.

The anatomical reasons for hyperflexion are

- (1) It is the most comfortable position. (2) The normal radial deflection can be best maintained.
- (3) The position overcomes the muscular lever action and the triceps acts as a splint posteriorly.
- (4) In this position 10 or 15 degrees of motion is a decidedly better functioning result than the same motion would be with the forearm in the right angle position.

In fracture of the olecranon full extension of the forearm is indicated. For fracture of the head of the radius an internal right angle splint is the best dressing.

ROBERT G. PACKARD

Wagner O : Treatment of Gunshot Fractures of the Lower Extremities by Nail Extension (Ueber die Behandlung von Schussfrakturen der unteren Extremität mit Nagelextension) *Arch klin Chir* 1916 cvll 19

Although he does not think that the treatment of gunshot lower limb fractures by nail extension is the treatment of choice, yet Wagner thinks it is indicated to cases where success by other methods cannot be expected. This is especially so where the shortening is extensive or in refractures or in an osteotomy of a fracture which had healed with deformity.

The general indications for treatment by nail extension are

1. In relatively recent gunshot fractures in which the fractured parts are still movable in which there is no serious muscular retraction but where other treatment methods are contra indicated on account of the extended wound surface and heavy secretions.

2. Uncomplicated gunshot fractures with movable fractured parts and a decided inclination to contraction where an extension plaster bandage does not promise good results.

3. To deformed healed fractures with shortening not less than 5 centimeters.

Under such indications Wagner has used nail extension to 27 cases, 22 being of the upper thigh. Of these cases 10 were for fractures healed with deformity of which 6 were refractured by sanguinary operation and 3 bloodlessly.

The disadvantage to which others have called attention, such as necrosis of bone splinters and increased suppuration, were not observed. Care as regards position and technique will obviate disadvantages.

The general advantages of this treatment are

1. A simple and prompt technique.
2. The application of extension treatment to large soft part wounds with heavy secretion because a smaller wound surface is required than in other methods.

3. The relatively slight pulling power especially in semiflexed positions.

4. Short duration of treatment (1) because there is reduction during the process of wound healing and (2) because there is no absolute immobility of the limb and muscle atrophy as well as ankylosis is avoided.

5. Easy observation of the whole limb and facility of bandaging.

6. Relative painlessness.

7. Avoidance of severe dislocation in old cases.

The general experience of Wagner with nail extension convinces him of its great use in gunshot fractures of the lower limbs in even unfavorable cases. He thinks that the field of use will be extended.

Clinical details of the 27 cases are tabulated.

W. A. BRENNAN

Syme P : New Instrument for Treatment of Fracture of the Femur *Bull Deft Public Charities* 1916 i 30.

The author describes an instrument to be used for obtaining efficient traction upon the lower end of the femur in fracture of that bone.

It consists of modified ice-tongs the important addition being a turnbuckle by means of which the tongs can be held firmly in place after being applied.

The advantages over the Steinmann pin method are that there is no penetration of the bone and therefore less chance of infection, and the bone is grasped and held just as firmly.

A plaster cast can be applied with the tongs in position and traction being kept up.

The author states that the apparatus is ideal in T shaped fractures of the lower end of the femur.

H. W. WILCOX.

Parham F W : Circular Constriction in the Treatment of Fractures of the Long Bones. *Surg Gynec & Obst* 1916 cxll 541

The author describes the work which he and Martin did on the treatment of fractures of long bones by means of circular bands. The method consists in passing a metallic band around the bone and threading one end into the other expanded end which has a slit. The excess is removed and the whole driven down flat by a few taps of the mallet on a chisel pressed against it. When tightened its own tension holds it in place. The band is of steel with a sufficient percentage of carbon to give it just the right degree of rigidity. The width varies from three to five millimeters.

Mechanically the band method is extremely simple and effective. The author does not discuss the question of interference with callus formation.

PHILIP LEWIN

Jensen J : Fracture of the Process on the Posterior Surface of the Astragalus. *T Al Verh S & Co* Goeteborg 1916 July

Behind the astragalus in a certain number of cases there is found a small free bone (os trigonum) analogous to the os lunatum of the hand. The cartilage of this bone is seen as early as the second month of fetal life. Very frequently this unites with the os talus and forms a posterior process of the astragalus and this process is frequently fractured in vertical injuries of the foot. The author

showed 6 such cases with their X-ray pictures. The diagnosis is made by the equinus position of the foot, the sensitiveness behind the bones, the limited plantar flexion of the foot and the movability of the hallux. The fragment was extirpated in one case.

In the investigation of 100 individuals without any foot troubles the author found a free bone in 6 instances. L. A. JUNKE.

SURGERY OF THE BONES, JOINTS ETC.

Vogel, K. Osteoplasti Power of Periosteum (Osteoplastik T. t gekelt des Periosts) Z. f. Ch. 96 N. 4

Vogel points out that according to Ribbert it is the relaxation condition in the periosteum in separation from the bone that excites the cells of the cambium layer to osteoplastic activity. Blier has founded his method of subperiosteal blood injections in the treatment of pseudo-arthritis upon the same conception.

Vogel was recently in a position to again observe a child on whom he had operated eight years before for pseudo-arthritis of the tibia and to operate again in the same place as previously owing to the occurrence of an additional infection. In the early operation he had inserted two paraffin disks for the purpose of inciting callus formation from the periosteum. At the later operation he found these two disks quite unaltered and not giving any evidence of amalgamation. They lay loose just as placed between the callus and the overlying periosteum, neither adhering to the bone nor to the periosteum. The observation according to Vogel proves that callus does not originate from the periosteum but from the osteoplastic element in the bone itself. W. A. BAI.

Magnusson P. B. New Mechanically and Surgically Correct Method of Bone-Grafting. S. G. Gyne. & Obst. 96 vol. 354

Magnusson points out the advantages and disadvantages of the most popular forms of open treatment of fractures claiming that the Lane plate irritates both the bone and soft tissues, lowering the resistance of both and making a fertile bed for infection, and that the length of the plate is unnecessary and causes an excess amount of traumatism in its application.

The bone plate of Brougham and Ecker is given preference over the Lane plate but is criticized from a mechanical standpoint on account of its brittleness and weakness at the screw holes and from a surgical standpoint because it is long and the attachments of muscles to the bone must be interfered with in its application.

The Magnusson ivory screws are discussed and given preference from a mechanical standpoint over all other forms of retention apparatus for the open treatment of fractures where the break is

oblique. Attention is called to the fact that when these screws were introduced in 1908 it was the first time that the thread had been cut by a tap preparatory to placing a screw in the bone, and the application of the screw in this way gave a snug fit with practically no traumatism and the maximum amount of mechanical strength.

The advantages of Magnusson's ivory plates in transverse fractures are: (1) minimum traumatism in position (2) the ivory is non-irritating to bone and soft tissue (3) it will not loosen (4) the apparatus is small and applied as a key in a keyway prevents any angulation of the fragments and, therefore, prevents all shortening.

The intramedullary bone graft is criticized from a mechanical standpoint because it allows motion between the fragments and some angulation of the same forming a ledge of the first class on the graft. With bone-graft it also necessitates an operation for removal of the crest of the tibia and the reaming of the medullary cavity of the fragments which delays union.

The bone nail is criticized from a mechanical standpoint as not being firm when it is tied in with the marrow tendons. Albee has recognized this fact and is now using autogenous screws. These are unnecessary because this autogenous bone, after being put through a machine, does not have any advantage over dead bone or ivory so far as regeneration is concerned. It is not so strong and the process of making the screws lengthens the time of operation and therefore the shock.

The new method advocated is that of cutting a graft from one of the fragments. The graft is shaped as a truncated cone, with the narrow end at the fracture line, this narrow end being exactly the width of the medullary cavity at that point. The opposite end is one and one-half to two inches away from the fracture is about one-eighth of an inch wider than the medullary cavity. The graft is removed by the author's circular saw, either a small saw or a chisel being used in freeing the end of the graft. This graft, with the periosteum attached, is then lifted out and the narrow extremity inserted into the end of the medullary canal of the fragment opposite to that from which the graft was taken.

This key of bone is driven in to half its depth, leaving the other half to be driven down into the slot left by the removal of this piece of bone. One-half of the graft therefore is driven solidly into the medullary cavity of one fragment, the other half of the graft is protruded from this fragment and into the medullary cavity of its fellow of the opposite side. The wide end of the graft is then held into the slot by an ivory screw driven through it and into the cortex below. In this way a very short piece of bone is made to do the work of a long bone graft put in in the ordinary way. There is comparatively slight traumatism at the seat of operation, the hemorrhage is reduced to a minimum, the tibia is not invaded and we have a mechanically and surgically correct method of bone-grafting.

Fuld J. E. Transplantation of the Abductor Hallucis Tendon in the Surgical Treatment for Hallux Valgus. *Surg. Gynec. & Obst.*, 1916 xxiii 626.

The author describes a new and very ingenious method which he maintains satisfies the three requirements of any operation for hallux valgus viz., (1) correction of the deformity (2) prevention of recurrence (3) preservation of the longitudinal arch. His technique is as follows:

1 Under general anesthesia, forcibly move the great toe in all directions, stretching the contracted tissues.

2 Paint the foot and toes with iodine.

3 Make a slightly curved incision about two inches long on the inner side of the great toe. A flap of skin and subcutaneous tissue is dissected free.

4. Retract the soft parts and dissect the abductor hallucis tendon free from its attachment to the base of the first phalanx.

5 Turn down a flap including the bursa capsular ligament, and periosteum, thus exposing the bony deformity.

6 Apply the chisel to the bone at the junction of the condyle and globular head of the metatarsal, and excise the hypertrophied bony projection longitudinally backward.

7 Irrigate the wound with a hot saline solution.

8 Replace the capsule to cover the raw surface of the bone and fix it with catgut sutures.

9 The tendon of the abductor hallucis is then transplanted to the middle of the inner surface of the first phalanx and sutured with fine silk or Pagenstecher thread to the periosteum.

10 Close the skin in the usual manner.

11 A plaster-of-Paris bandage is applied to the foot and toe holding the toe in a slightly over corrected position and is allowed to remain for a week or ten days.

The after treatment consists in the wearing of properly shaped shoes.

PHILIP LUKWIS

Hackenbruch: Treatment of Old Deformed and Contracted Cured Fractures (Behandlung veralteter difforme und verkürzter gehelter Frakturen). *Deutsche Zeitschr. f. Chir.* 1916 cxxxvi No. 6.

Hackenbruch gives his experiences in the treatment of old deformed and contracted fractures of the diaphyses of the extremities. He treated 10 such fractures varying from 6 months to 2 years old, with a shortening in some cases of 13 cm. Two of these were refractured by manual osteoclasis the remaining eight being treated by osteotomy. The refractured cases recovered after the application of the distraction clamp apparatus. In the other cases by a combination of the distraction clamp with Steinmann bone extension recoveries with good functional position were obtained.

In bloody operations executed under rigorous asepsis the smallest possible skin incision was made.

After chiselling the bone and correcting the malposition distention was effected by the slowly increasing pull exerted by the Schoemann bone-extension apparatus all cases so far treated have had surprisingly good results, without danger. When the desired degree of lengthening has been obtained with the bone-extension apparatus, the distraction clamp bandage is applied for eight to ten days longer the patient being suspended in bed.

W. A. BRENNAN

Campbell, A. M. A Consideration of the Anatomy and Surgery of the Knee-Joint. *J. Mich. St. M. Soc.* 1916 xv 321.

Excision of the knee was more common twenty five years ago than it is today being then often done for minor injuries, while now the operation is practically limited to cases of advanced tuberculosis of the knee. Drainage, partial excision, intra-articular medication and arthroplasty are now common operations. Opening the knee means some loss of function, the operation nearly always being more serious than opening the cranial, pleuritic, or abdominal cavity. This is possibly due to the fact that the knee-joint does not have the stomata of the abdomen which act as natural drainage. Tenney believes all opened joints should be drained, even if aseptic.

Fracture of the patella should be treated by open operation, apposition of fragments, and use of only such ligaments as the joint can absorb. Suture of periosteum is sufficient. Only active and passive motion should be used in fracture of the tibial spine fragments must be removed. Injury to semilunar bodies is the commonest injury to the knee-joint the cartilages may be dislocated partially or entirely fractured, or buckled upon themselves their edges may be frayed, or a piece broken off may wander about and lock the joint. This locking occurs most frequently when the knee is flexed and the tibia rotated happening sometimes a long time after the original injury. Robert Jones says to keep the leg extended for six weeks. Morrison says immediate removal of cartilage should be accomplished.

The crucial ligaments serve to limit flexion, extension, and rotation. Rupture is shown by an anterior, posterior and rotary movement. Jones says fixation should be carried out for three to six months others say the ligaments should be sutured.

To open the knee, preparation must be extreme not even the gloved finger should enter the joint the synovia must be everted on closing and drain age instituted for at least a few hours. Probably the linear incision on the inside is best though anterior (by splitting the ligament and patella) or posterior opening may be made. The ligamentum mucosum divides the knee into anterior and posterior parts and must be destroyed to insure adequate drainage which is an important factor in knee operations.

ROBERT G. PACKARD

ORTHOPEDICS IN GENERAL

Bartow D., and Plummer W W. The Operative Treatment of Poliomyelitis. *Am. J. Orth. Surg.* 9 6 xi 504.

The authors give a brief report including a résumé of 151 joints operated upon at the Children's Hospital. The general plan included the use of artificial ligaments, tendon transpositions and fixations, combined with such relief of contractures and correction of bone deformities as was necessary. Osteotomy for knock knees was the most frequent bone operation, remodeling of the tarsal bones was necessary in only a few foot cases. No arthrodeses were done except in a small number of flail hips.

The joints affected were: ankle 77, knee 44, hip 17, shoulder 1, elbow 1, wrist 1, spine.

PHILIP LEWIS

Davis, G G. Treatment of the Paralysis Following Poliomyelitis. *Am. J. Orth. Surg.* 9 6 xi 604.

The author states that the disability resulting from the paralysis due to epidemic poliomyelitis is caused mainly by the disturbance of balance of power in the affected parts. In addition to balance an endeavor should be made to restore to the limb stability and power.

During the stage of improvement apparatus may be employed to support the part and prevent the development of deformity while the restoration of lost power is encouraged by suitable physical exercises and training. When no further restoration of muscular function is noted, say three years or more after the occurrence of the paralysis, then the stability which up to this time has been obtained by the use of apparatus may be secured by various operative procedures.

For flail shoulder a certain amount of benefit is derived by fixation procedures, such as arthrodesis or silk ligaments. For the wrist burying the paralyzed tendons of the extensor carpi radialis longior and brevior and ulnaris in the underlying bones makes it possible to maintain a drooping hand in a straight and more useful position.

For paralysis of the trunk it is possible that in some cases bone transplantation to impart rigidity to the spine will be of service.

A detailed description is given of the treatment of paralysis of the lower extremity. Beginning with the foot, the first requisite is to fasten the foot in the shoe and the next is to hold the shoe in the proper position. If there is a moderate tendency to valgus or varus a raising of the outer or inner edge of the sole one-eighth to one-fourth inch or even floating the sole and heel out at the side with perhaps the aid of an inside pad to support the arch, may be all that is necessary. If the paralysis is more severe one or two side-irons with a joint at the ankle are required.

For paralysis of the knee joint Davis stabilizes by means of the slip ring lock joint. When the back is weak a supporting corset or brace is used.

By means of these appliances the patient is carried along for three years or more while diligent efforts are made by training to increase the power in the paralyzed limbs. Finally when convinced that progress is too slow to justify continuing with apparatus alone the question of operation becomes urgent.

For varus and valgus deformities he recommends his subastragaloid arthrodesis which consists in digging up the contiguous surfaces of the astragalus above, the os calcis behind and the scaphoid in front, through two incisions, one below and in front of the internal malleolus, and the other below the external.

In cases of calcaneocavus Da vis recommends his operation as follows: the peroneal tendons are transplanted into the os calcis, the adjoining surfaces of the os calcis and astragalus are thoroughly dug up and the chips allowed to remain. He then makes a complete horizontal transverse section of the foot just below the malleoli and the foot is forcibly thrust back about 3 cm. The foot is encased in plaster, in which a foot board is incorporated and placed in slight extension with the sole absolutely level.

The author enumerates various operations for foot-drop and unstable knees. For persistent outward rotation of the leg he sews the anterior free edge of the fascia lata to the posterior surface of the trochanter. It is rarely necessary to perform arthrodesis of the hip.

PHILIP LEWIS.

Whitman, R. Remarks on Anterior Poliomyelitis with Reference to the Principles of Treatment and Their Practical Application. *Med. Rec.* 9 6 xc 60.

The author believes the 1916 epidemic of infantile paralysis differs from previous epidemics in its larger mortality, greater number of cases, and larger percentage of complete recoveries. He believes the work of the social workers is of the utmost importance in connection with the epidemic in that they have opportunity to observe the cases and advise parents at home.

He does not believe the extent of paralysis can be determined during the acute stage, so per cent go on to complete recovery. The orthopedic treatment is directed along lines to maintain paralyzed members in such state that they are capable of service when called upon during recovery and make paralytic members useful.

Under causes of deformity gravity, posture, muscle unbalance and weight-bearing are given. The treatment should consist in manipulation to the full extent twice daily in all directions, this should be supplemented by massage, warm baths, and electricity in older children.

H. W. MERRIMAN.

Truax, W. Prevention and Correction of Deformity in Poliomyelitis. *Long Island M. J.* 9 6 453.

The epidemic of 1916 has been the first epidemic in which much was done toward prevention of

deformity. In less than one week of its beginning orthopedic surgeons were appointed to work among the cases quarantined in the New York hospitals. Thus muscle conservation and deformity prevention were begun at the outset.

The principles of treatment include conservation of muscle tone from the start, prevention of muscle strain such as foot-drop from pressure of bed clothes and beginning of muscle development as soon as soreness has subsided. The enforcement of the horizontal position in bed, the paraphernalia used to prevent foot-drop and outward rotation at the hip, the Bradford frames used to support the back, abdominal, and respiratory muscles and plaster splints were all very valuable in this epidemic.

As soon as it is known where the residual weakness will be, braces may be applied. An efficient brace should be of light weight, should be padded over the bony parts but close fitting, its parts should be extensible for growing children. The joint activity should supplement the activity of the weak muscles and prevent contraction of the stronger muscles. Such a brace will prevent muscle strain but develop muscle power.

Massage must be carefully begun after the soreness has ceased in order to warm up the skin and effect blood supply to the muscles. Muscle training consists in daily carrying through the activities of the joints involved to the full extent of their anatomic mobility with outside aid gradually supplemented by the patient's aid but fatigue must never be reached. Electricity has its advocates and may be of use but its value is certainly overrated. Keeping the part warm is a big factor in promoting the circulation.

ROBERT G. PACKARD

Nutt, J. J.: Treatment of Paralysis Following Acute Poliomyelitis. *Long Island M J* 1916 x 474.

Nutt takes up the treatment of infantile paralysis after the fifth week. The pain and stiffness have then usually disappeared, and an ambulatory brace should be designed for any patient who can sit up without support can be fitted with braces which will enable him to stand and probably walk. The object of the brace is not to produce immobilization or prevent deformity but to permit functioning of all the tissues which are not paralyzed and to protect the tissues which are paralyzed. If the only function restored is that of weight bearing the brace is worth while. The way to develop a physiologic function is exercise of that function but exhaustion is detrimental and electricity is probably of no value.

A brace without joints is little better than a plaster cast. In case of a paralyzed quadriceps femoris, a lock joint allowing for bending when sitting is indicated and at the ankle an absolutely stiff joint is never desirable though lateral deviation may be prevented and a stop in the joint can prevent plantar or dorsal flexion as indicated. If both

anterior and posterior groups are paralyzed motion should be limited to an arc of six degrees, to prevent strain yet to stimulate structures and make walking easier. The three common criticisms of braces are (1) the upright is not fitted close enough to the leg, (2) the upright is not in the transverse plane of weight bearing and (3) the joint of the brace is not within the arc of motion of articulation. The axis of movement in an apparatus should not cause interarticular pressure. In long leg braces, the joint of the brace should be placed at or above the anatomical joint but never below it. In the ankle the position should be between the tip of the external malleolus and the bottom of the foot.

Paralysis of the deltoid should be protected as soon as the patient sits up preferably by a brace which holds the arm extended to a right angle and the forearm flexed.

In his treatment Nutt advises removing all braces for two hours in the morning, allowing the child to use voluntary motions as he will. But certainly fatigue must be avoided by letting the child rest at the first inclination.

ROBERT G. PACKARD

Peckham, F. E.: The Treatment of Infantile Paralysis. *N Y M J* 1916 clv 1045.

The author briefly describes the pathology of this disease, laying stress upon the fact that mechanical pressure upon the nerve elements from hyperemia, cellular infiltration and edema may readily account for the widespread paralysis during the acute stage. Working upon this hypothesis, he believes that the use of physiotherapeutic agents combined with mechanical appliances very early will result in more perfect recoveries.

The weakened or paralyzed muscles are first exposed to a 500 candle-power electric light screened with blue glass. This causes pain to disappear when vibration may be applied. He also believes that the static wave current will dissipate infiltration and edema. During the subacute stage, he places great importance upon passive and active muscle exercise.

H. W. WILCOX.

Frauenthal, H. W.: The Treatment of Infantile Paralysis. *N Y M J* 1916 clv 1043.

The author sets forth briefly what has been learned from the epidemic in New York during the summer of 1915 as to treatment in both the acute and chronic stages of infantile paralysis.

Four lines of treatment were carried out in the four city hospitals of New York during the acute stage: (1) internal use of hexamethylenamine, (2) intraspinal injection of adrenalin, (3) injection of immunizing serum from patients recovered from the disease, (4) the injection of normal serum of healthy persons. It is stated that with each of these treatments there were numerically as many deaths as many complete recoveries, and as many cases of paralysis, so that no apparent advantage accrues from any line of treatment, although the

author further states that where the disease was diagnosed in its incipency, before the manifestation of any paralysis, the disease has been checked and paralysis averted by the injection of immunizing serum obtained from cured cases.

The author begins treatment in the second week. Neuritic pain may be much relieved by immersion in a warm bath or an electric light bath.

He uses aluminum splints to prevent contraction deformities, condemning the use of plaster of Paris because of its tendency to atrophy additional to that caused by the disease as well as the danger from possible sloughs caused by unskillful application of the casts. The author strongly advocates electrical treatment beginning it when paralysis appears, using a faradic current alternating with combined galvanic and faradic current. The strength of the current should be the weakest that will produce a contraction and over a period of only two or three minutes on any particular muscle and from six to twelve minutes on the body at one time.

Massage treatment should be begun just as soon as acute inflammatory symptoms have disappeared and should be continued faithfully for weeks and months.

The author uses the immersion bath, temperature 95 to 100 F. for twenty minutes each night.

Late on in patients over three years old muscle education by means of passive and active exercises done before a mirror directing the patient to concentrate his mind on the affected muscles has been the means of more rapidly bringing the muscular movement under the control of the will.

H. W. WILCOX.

Sayre, R. H. The After Treatment of Infantile Paralysis. *A. J. M. J.* 96:1 29.

The author divides the treatment of infantile paralysis into five groups: (1) medical, (2) electrical, (3) manipulative, (4) instrumental and (5) surgical.

He believes that strychnine is distinctly helpful and should be administered in increasing doses until some result is produced or the toleration point is reached. He also feels sure that there is much benefit to be derived from the use of faradism and galvanism. The strength of the current should be the smallest which will produce muscular contraction. Manipulations are very essential but should never be employed so long as tenderness of the peripheral nerves exists, but should be used after the limb has become tolerant of movement. Manipulation of the muscles, deep kneading, rubbing, and superficial stroking are most important. Muscle training should be employed but the amount of exercise given a paretic muscle must never be to the point of overfatigue which will result in harm rather than good. Heat applied to the paralyzed extremity by the electric light oven or artificial convection by immersion in a vacuum cup are of great service.

Instrumental support for the paralyzed upper extremity is of comparatively little value, but in the

lower extremities it is frequently essential the apparatus should be light and girdle the limb as little as possible. The number of cases which are amenable to surgical treatment is comparatively small, and the majority are better treated by mechanical support, but a certain number derive wonderful help from surgical intervention. It enables some cases to dispense with the use of apparatus altogether and makes it possible for others to use a much lighter form of support. ROBERT G. PACKMAN.

Roberts, P. W. The Influence of the Os Calcis on the Production and Correction of Valgus Deformities. *Am. J. Orth. Surg.* 9:6 219-220.

The author is of the opinion that many malpositions of the feet and weak feet are in a great measure due to the shape of the under bearing surface of the os calcis. He thinks that if the under surface were flat instead of round many valgus deformities would never occur.

The bearing area of the os calcis is extremely small. Whatever weight may be borne is in reality resting on a body with an arc for a base. It is axiomatic in mechanics that a body with an arc for its base can bear a superimposed weight without tilting only when the thrust of that weight is received over the center of balance and that when received away from the center it will tilt in proportion to the force of the thrust and the distance from the center at which it is applied.

So long as the weight of the body is carried over the center of balance of the os calcis or to the outer side of the center no strain upon the longitudinal arch occurs but when the weight is transmitted to the inner side the arch is depressed and the first stage of weak foot is seen.

The author highly recommends a small plate which extends only to the anterior border of the os calcis. Its floor is tilted upward on the inner side and its flange extends backward to the posterior and upper border of the inner side of the heel. Just below this the metal is bulged to allow room for the soft parts when the heel is rotated. A flange on the outer side prevents slipping laterally. Later the plate is modified to support the transverse arch.

In conclusion Roberts urges that the influence of the os calcis on the lateral deformities of the foot is deserving of more consideration than it has heretofore received, for thorough control of this bone much may be accomplished in the prevention and correction of malpositions and in the relief of symptoms which so frequently ensue. PETER LARSEN.

Stephenson, C. E. A Successful Method for Correcting Fallen Arches. *Indianapolis M. J.* 9:6 215, 490.

After recalling to mind the two types of arch trouble, the longitudinal and transverse and describing the present types of shoes Stephenson advises for fallen arches, the fitting of a perfectly constructed arch support. He takes an impression of the bottom of the foot, makes a cast from it

and trims it to the shape and length desired. Over this cast is built the arch support made of a hardening cement unaffected by moisture or heat. By a curing process the proper flexibility is obtained and the support covered with leather. The author claims as advantages for this support, its lightness of weight, its comfort and its stability. He condemns the habit of sending patients to shoe stores for arch supports.

ROBERT G. PACKARD

Fluke E. W. The Conservative Treatment of Club Foot. *Am J Orth Surg* 1916 xiv 693

The author states that in a comparison of cases treated by operation with those unoperated there were 95 per cent satisfactory results in the latter as compared with 55 per cent in those operated. He strongly advises the conservative treatment. For the attainment of perfect results by this method there are three requisites: constant personal management, strict adherence to the principle of non-traumatism at all stages and a careful and thorough technique. The measures available for conservative treatment are manipulation to the point of tolerance, plaster redressment or other mechanical fixation, weight bearing, massage and exercises.

For relapsed club-foot Fluke recommends correction, overcorrection and retention. He first applies Heuser's glue to the skin from the toes to the knee and stretches stockinette smoothly over it. A pad is placed under the prominence on the outer border of the foot and a plaster cast applied in three parts: viz. a boot and a legging and after they have hardened a third part joining the two while the boot is forced into an abducted and everted position. The legging is strongly rotated inward on the leg. Beneath the sole of the boot an outside wedge of plaster is placed. After a certain amount of flexibility and fair correction have been established a plaster similar to that of Ehrenfried is desirable. This consists of three parts: a thigh cuff, a boot and a joining part fixing the knee in flexion, the foot in eversion and dorsiflexion. Next a retentive brace with an inside upright is used together with an outside lift on the sole of the shoe and a T strap around the ankle. A stop-catch joint is inserted at the ankle. A simple brace is worn at night. With the omission of the plasters, massage and muscle-training are of great value.

The author uses the talpometer for recording in degrees the angles of deformity in the three planes of motion of the foot. He concludes that the application of thoroughly conservative methods without sacrifice of structure or action, and the accomplishment of perfect results in rigid relapsed club-feet are in no way incompatible.

PHILIP LEWIS

Fluke E. W. The Role of Orthopedic Surgery in Early Treatment of Injured and Wounded. *Med Surgeon* 1916 xxxix 497

The author portrays the great value of orthopedic surgery as seen in the organization of the hospital

systems of the principal contending armies of Europe.

Prophylactic orthopedics embrace a general application of preventive measures which are dependent upon the proper use of apparatus, massage and manipulation on injured limbs and joints. Ankylosis may be prevented in traumatized or septic joints by the systematic manipulation of the joint. In the more severe cases where ankylosis can not be prevented, future usefulness of the limb will be assured by immobilization measures or dressings that retain the joint in the most favorable position for locomotion or prehension. Deformities from the contraction of a scar in the damaged soft parts is prevented by the early application of simple splints. In deformities due to paralysis of certain groups of muscles from nerve injury the contiguous joint should be corrected or better overcorrected by apparatus, in order that contraction of the unopposed muscle groups may be prevented and the paralyzed group of muscles saved from overstretching which will naturally add to the liability of permanent paralysis.

Minor injuries confined to the joints and back and unaccompanied by open wounds require an accurate diagnosis of the exact structures damaged and a definite direction of the treatment toward the repair of the tissue affected. Splints may be used for these traumatized joints especially if combined with strapping and compression bandage but plaster of Paris is by far the most efficient means of limiting all motion and at the same time mechanically relaxing the injured structures.

Wounds into the joints and compound fractures of long bones, complicated as they usually are by sepsis must first be provided with ample free drainage. Second in importance is thorough immobilization of the part which may be done without interfering with drainage, and third should come attention to alignment and position for future function. Reposition may be obtained so long as the callus is soft or the adhesions in the joint have not become too strong.

ROBERT B. CORFIELD

Dobrowolska N. A. The Regeneration of Bone in Its Relation to the Cultivation of Bone. *Brit J Surg* 1916 i 333

The experiments were carried out as follows: Small pieces of bone taken from young animals—mice, kittens, rabbits—were placed on slides in homogeneous plasma, and covered with a watch glass with a hanging drop of distilled water which was hermetically sealed with paraffin. This preparation was placed in the incubator and examined from time to time. His conclusions are:

1. Bone tissue is capable of producing a luxuriant growth *in vitro*.

2. The living elements of compact bone tissue are also capable of developing new cells.

3. The islets of osteogenetic tissue around a piece of bone deprived of its periosteum and transplanted into the soft tissues probably arise from

the growing cells of the transplanted compact bone.

4. When the bone is transplanted with its periosteum, the growth is more active.

5. In order to obtain sufficient strength it is necessary that the bone should be connected with the matrix bone through which it enters into normal conditions.

6. Blood coagulation aids the growth of osteogenic cells by means of its fibrous network.

7. The practical lesson is splinters in non-suppurating fractures must be treated most carefully and if possible the wound must not be interfered with. In suppurating cases the extraction of splinters should be delayed as long as possible in order to give the organism a chance to profit by the regeneration of bone.

Paper Lx: 1

Manhelli N. K. and Koenig, E. C. Postures and Types of Breathing Exercises. *Am J Orth Surg* 9 6 934

The authors carried out numerous experiments using the fluoroscope as an aid in determining the excursion of the diaphragm and viscera. They conclude that there are many factors which influence the function of the stomach, intestines, and

other digestive organs that many persons with pronounced ptosis may be apparently unaffected by that condition that there is a great prevalence of such disturbances as constipation, low grade intestinal toxemia, atony of the intestines, retroversion of the uterus, and hernia. These certainly may be caused mechanically by constant forcing down of abdominal organs. There can be no advantage and many disadvantages in the low position of these important organs.

In standing as well as in the sitting or lying position, abdominal contraction alone (done in a quiet, unburned manner) elevates the organs from one to six inches. Thus they have an exercise that certainly is mild but which when often repeated proves very effective.

They recommend that the breathing exercises should be done quietly in rhythm somewhat like walking. They may be repeated if they do not cause fatigue four to ten times three to four times a day sometimes gave good results. The general physical condition, muscle tone, good habitual posture, regular judicious exercises, and clothing giving full freedom are undoubtedly large factors in the position and function of the abdominal organs.

Paper LXVII.

SURGERY OF THE SPINAL COLUMN AND CORD

Arnold, E. H. Fixation of the Sacrum. *Am J Orth Surg* 9 6 574

The author believes that fixation of the sacrum is absolutely indicated in all cases where the usual mechanical methods of fixation such as strapping, belts, and braces, have failed to accomplish results. The operation is practically without risk and danger except that incident to anesthesia, and as it shortens the time of treatment and lessens considerably the expense to the patient it is indicated, economically. Where the lesion and distortion are plainly evident and of some degree of severity, the operation is indicated from the start. Usually however the patient is better satisfied with having the operation done after some other method has been tried. The only contra-indication is in the case of young females who may expect to become pregnant. In the males there is no interference with industrial or other pursuits. In the case reported the following points are of interest:

Location of lesion sacrum 3 sacrolumbar 4 sacro-iliac 3 fifth lumbar

Probable etiology of factor tubercular 4 traumatic arthritis 4, doubtful

Nature of operation 2 sacrolumbar grafts 1 sacrolumbar graft sacrolumbar and 2 sacro-iliac grafts, 1 sacrolumbar and sacro-iliac graft 8

Results Good complete and rapid recovery 8 fair 1 slow but good and complete recovery

Time elapsed case, 3 years and ten months 1 case year and four and a half months.

The technique is as follows:

1. In the sacrolumbar operation two grafts from the tibia are implanted on the two sides of the spinous processes of the last three lumbar and the first two sacral spinous processes. Arnold recommends that plaster of Paris be dispensed with.

In the sacrolumbar fixation the typical Albee technique is used the tibial graft being inserted between the split spinous processes of the last three lumbar and upper two sacral vertebrae. Seven to eight weeks rest in bed is recommended.

3. In the fixation of the sacro-iliac joints one or two tibial grafts are inserted into a trough chiseled across the ilium and sacrum. Rest in bed for six weeks is recommended.

Paper LXVIII.

Craig C. B. Injuries to the Spinal Cord Produced by Modern Warfare. *Am J Orth Surg* 9 6 615

This article is based upon a study of thirty cases of spinal cord and nerve-root injury under treatment at the American Ambulance in France.

The author states that peripheral nerve-trunks are not susceptible to concussion. Concussion of the spinal cord with hematomyelia may cause paralysis, which is usually rapidly and completely recovered from. Seven such cases are reported. Contusion or laceration of the spinal cord by actual contact of a projectile causes, according to the location of the injury paraplegia, quadriplegia, or cauda-equina symptoms, with cystitis, pyelone-

phntis, and general sepsis, with great pain. The condition does not improve and is eventually fatal. In laceration of nerve trunks with loss of continuity the outcome is unfavorable because all are infected, scar tissue of great density forms embedding the retracted nerve-ends, and nerve suture becomes thus very difficult.

Compression of nerves by scar tissue or bone callus comprises but a small per cent of all cases, but if the compressing material is removed early these nerves regain function. H. W. WILCOX.

Plummer W W. A Case of Spinal Cord Tumor. *Am J Orth. Surg.* 1916 xiv 734.

Plummer reports a case of giant-cell sarcoma of the spinal cord in a sixteen year old boy. The symptoms were persistent high dorsal backache pain in both legs, and some loss of power. Later he was unable to walk. There was increasing spastic paralysis of both legs with convulsive movements. Sensation was absent to the level of the third rib. The bowels were moved by lavage the urine was under fair control. Operation revealed a tumor mass under the tips of the second and third dorsal spinous processes. Examination showed it to be a giant-cell sarcoma. The interesting points about the case are that the tumor as found at operation should have produced the equivalent of a complete section of the cord at the level of the second dorsal vertebra and that the excellent stereorontgenograms gave no definite hint of the enormous bone destruction. PHILIP LEWIS.

Skog, A. L.: Spinal Cord Neoplasms. *J M St M Ass* 1916 xli 585.

Skog reviews the pathology of spinal cord tumors and reports in detail a case in which a typical psammoma was removed successfully from the spinal cord in the region of the fifth, sixth, and seventh spinous processes of the dorsal region.

He urges the necessity of early diagnosis, and he believes there is reason for being enthusiastic regarding operative intervention in properly selected cases of tumors of the spinal cord. D. L. DEMPARD.

Riosalido Radiographic Symptoms of Pott's Disease (Síntomas radiográficos del mal de Pott). *Rev Ibero-Am de cir. méd.* Madrid 1916 xxxvi 377.

Riosalido says that systematic radiography of every patient with pains in the vertebral column and who shows any evidence of Pott's disease will result in a secure diagnosis before the lesions and deformations advance to a point where they are irredeemable.

Radiography has been able to demonstrate why cyphosis is absent in cervical Pott's disease, only medium in lumbar and much pronounced in dorsal. In the first region when a vertebral body is destroyed partly or totally fusion with the underlying parts is prevented by the pedicles and transverse apophyses which in the cervical region are implanted in

the lateral part of the vertebra. Moreover, the very mobile posterior arch of the spiny apophyses which imbricate into each other usually adjust themselves with the parts below. There is no prominence no extensorization in the form of a cyphosis and in no patient with a cervical Pott's disease will a hump be found.

In the lumbar region however the pedicles and transverse apophyses are implanted more posteriorly than in the cervical region, adjustment of the posterior arch can be verified here to a certain extent which is proved by the great dorsal flexibility of this part of the column which leads to the same end i.e. there is little ostensible cyphosis. The most that appears is a slight prominence and this is balanced by the compensatory lordosis which is soon established.

On the other hand in the dorsal region where movement of extension is very limited and approximation of the posterior arch is lacking when a vertebral body is destroyed it tends to fall upon the lower parts very rapidly without any hindrance by the posterior arch. Moreover the cyphosis which results is not balanced by any compensatory lordosis because there is none or very little in this region.

The author exhibits radiographs of different cases observed in his clinic to illustrate the findings in various types of lumbar dorsal and cervical Pott's disease, and to denote how they should be interpreted. W. A. BRENNAN.

Young J K. Compression Fracture of the Fifth Lumbar Vertebra. *N Y M J* 1916 civ 982.

The author reports four cases of compression fracture of the fifth lumbar vertebra two of which also had fractures of the transverse process. The usual cause of this fracture is a fall, the patient landing on the buttocks. The shock is out of all proportion to the injury sometimes the patient is even unconscious. Pain is a constant symptom and is increased on sitting down and getting up. Local tenderness, muscular spasm, and limitation of motion are present but there are no cord symptoms such as paraplegia or sphincter disturbance. Should there be also a displacement of the sacro-iliac synchondrosis, Kernig's sign may be elicited. A lumbar scoliosis may be present. The disalignment of spinous processes is a prominent sign.

Lesions to be differentiated from this condition are (1) fracture of the transverse process, in which there is never scoliosis (2) displacement of the ilium which is not accompanied by disalignment of the vertebrae (3) lateral deviation in Pott's disease in which kyphosis is the differentiating sign (4) rachitis of the pelvis, which would be associated with other signs of rachitis (5) malignant disease (6) arthritic deformans, in which diagnosis can be made by roentgen picture. The treatment recommended is extension from the head and feet, the patient lying on a hard mattress or in a plaster shell followed after the symptoms subside by a spinal brace. W. A. CLARK.

SURGERY OF THE NERVOUS SYSTEM

Heinemann, O. Gunshot Injuries of the Peripheral Nerves; Anatomic Investigation of the Inner Structure of the Great Nerve-Trunks (Ueber Schussverletzungen der peripheren Nerven anatomischen Untersuchungen ueber den inneren Bau der grossen Nervenstaebe.) *Arch f Klin Chir* 9 6 cvlil.

Heinemann finds that nerve-suture has in general given 70 to 80 per cent positive results. In his own cases he obtained 75 per cent good results.

Although Stoffel has condemned nerve transplantations, yet by this means Gratzl obtained 66 per cent successes in nerve-defects. The prognosis of gunshot injuries of the nerves is in Heinemann's experience good. Previous to the war it was known that the reconstitution of nerve functioning took a very long time. It takes about two years before it can be stated with certainty that there is no return of nerve functioning. Heinemann's optimism is based upon his observations of recovery in apparently non-curable cases. There were only two cases of nerve suture in which positive results were not obtained and these are still under observation.

The most striking successes are obtained in neurolysis. Paralysis may disappear within twenty four hours whereas after resection such a result is not usually obtained till after two months.

For the after treatment of nerve injuries Heinemann advocates electricity. Systematic electrical treatment greatly facilitates recovery. This is particularly the case in patients with weak will-power. W. A. BLEDMAN

Steindler A. Direct Neurotization of Paralyzed Muscles. *Am. J. Orth. Surg.* 9 6 xiv 707

The object of the paper is a study of the boundaries of physiological nerve-regeneration and a search for the possible clinical applications of physiological facts to pathological conditions.

Steindler's technique as applied to dogs and cats was as follows. First, an incision was made along the femoral vessels and the anterior crural nerve was dissected. It was then divided at a point well above the level of the upper muscle branches and a distance from one to one and one-half inches was resected. The central end was then turned upward and fastened securely into the muscles of the abdominal wall, in order to prevent the regeneration of the anterior crural nerve. Then a posterior incision was made along the posterior border of the glutei, and the sciatic nerve was dissected. One can see this nerve distinctly divide into two bundles, of which the upper corresponds to the anterior and the lower to the posterior tibial nerve. The anterior tibial bundle was then spliced off and cut low enough to leave a central end of sufficient length. This end was then brought forward through a tunnel in the muscles and after refreshing the cut, was directly implanted into the vastus externus muscle. Here it was held securely by fine catgut sutures. The wound was sewed with catgut and silk-worm gut and covered with tincture of benzoin.

From his experiments Steindler concludes as follows:

Direct neurotization is possible. The natural limits of physiological regeneration allow a motor nerve directly implanted into paralyzed muscle tissue to establish by regeneration the entire chain of neuromotor connections. This regeneration seems to be complete in from eight to ten weeks.

In close succession the muscle tissue also regenerates and the regeneration takes place centrifugally from the point of implantation.

Hyperneurotization probably does not occur.

Apparently totally paralyzed muscles in infantile paralysis contain a variable amount of perfectly normal muscle fibers and a considerable amount of nervous elements. PHILIP LEWIS

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

Kahn, M.: Diagnosis of Cancer. *J. Lab. & Clin. Med.* 9 6 h, 3.

Kahn reports his experience with the gastro-albuminorrhea test for gastric cancer and with the Salkowski-Kojo urinary colloidal nitrogen test and the Solomon Saxl neutral sulphur test for general malignancy. In his hands, the test for gastric protein by means of the Wolff-Jungmanns modification of the Solomon method gave excellent results. A negative result with this test speaks against malignancy; a positive result may also be given by gastric ulcer and acute and chronic gastritis. The

performance of the Salkowski-Kojo and Solomon Saxl tests conjointly in the same case has yielded very significant results if these tests are both positive. A negative result with one or the other of these tests speaks against malignancy.

Vance, B. M. Multiple Myelomata, with a Discussion as to Its Nature and Origin. *Am. J. M. Sc.* 9 6 cvlil, 693.

A summary of the autopsy findings in the case reported is as follows:

A multiple primary neoplasm of the bone-marrow was found which extensively infiltrated the ribs, cervical vertebrae, clavicles, sternum, and femur.

The tumor tissue caused destruction of the bone wearing away the cortex to a thin layer and entirely replacing the cancellous bone. The neoplasm was confined to the osseous system, the viscera were not involved nor were the surrounding soft tissues infiltrated except in the neck. The tumor was yellowish white in color soft in consistency and homogeneous in appearance resembling a rapidly growing round-celled sarcoma. The masses in the sternum and the head of the right femur showed extensive hamorrhages which gave the neoplasm a dark red appearance like clotted blood.

On microscopic examination the tumor-cells were found packed together in a stroma, consisting of very fine cellular connective tissue delicate blood vessels, a fine eosinophilic ground substance, and red blood-cells whenever the section was taken from a hamorrhagic area.

The author reaches the following conclusions after discussing the subject thoroughly

1 The multiple myelomata are multiple primary tumors of the bone-marrow occurring for the most part in elderly individuals and manifested during life by deep-seated pain in the bones characteristic deformities of the skeleton, spontaneous fractures in many bones of the body severe secondary anemia and emaciation

2 The presence of Bence-Jones protein in the urine is characteristic of many cases of multiple myelomata, but it is not a pathognomonic sign of the disease as it is occasionally found in the urine of other bone conditions

3 At postmortem, cases of multiple myelomata show the presence of soft homogeneous tumor masses which replace the cancellous tissue of the bones of the trunk, the vertebrae, ribs, and sternum, and less often of the ends of the long bones of the extremities the diploe of the skull and the small bones of the hands and feet.

4 The multiple myelomata are confined to the bones, though a few cases have been reported of extraskeletal growths

5 The multiple myelomata are composed of cells practically identical with the myeloblasts of the bone-marrow or their derivatives. Five different groups of these tumors have been described (1) myeloblastoma, (2) neutrophila myelomata, (3) erythroblastoma (4) lymphocytoma, (5) plasmacytoma.

The first three tumor types are true multiple myelomata. The lymphocytoma is a distinct tumor type but as there is considerable doubt regarding the relation of the tumor-cell to the myeloblast, it cannot be unquestionably classified as a true myelomata

The plasma cell tumor cannot be considered as a pathological entity until more is known about the origin and mode of development of the plasma cell

6 The multiple myelomata belong to that group of tumors which are composed of cells derived from the primary mesenchymal *blastzellen* and are

closely related to the leukemias, chloromata and other diseases of the lymphatic haemopoietic apparatus.

EDWARD L. CORNWELL.

Wagner J H: Chondroma of the Pelvis *Surg Gynec & Obst.* 1916 xliii 604.

The author has summarized the work upon chondroma of the pelvis beginning with the work of Muller in 1836 and including the available material to the present day 303 cases in all

The chondroma is usually of the hyaline cartilage variety and may appear as an enchondroma or an exchondroma. In the former the trabeculae are more abundant in the latter degeneration is apt to occur owing to the limited blood supply. The degeneration is usually myxematous.

These tumors are usually single, irregularly globular surrounded by a definite capsule and attached to the parent tissue in a sessile manner. They range in size from a hazelnut to masses 100 cm. in circumference

The pelvis in view of its embryological development and numerous centers of ossification has many locations from which these tumors may arise. Traumatism is a definite factor in the production of these tumors a view held by Virchow Muller Letenneur and others. In the author's two cases, the tumors followed a definite trauma. Sandler Whartmann Helmholtz and others have shown that chondroma may arise by the transformation of fibrous tissue into cartilage. The series of steps in this process of metaplasia has been observed in the author's two cases and in spite of the many other possibilities, he believes this is the most frequent mode of origin. These tumors are as a rule, benign, and their malignancy is due to position. However cases showing metastases by direct extension or by growth into the lumen of surrounding vessels have been shown to take on a sarcomatous character. The age of frequency is between 20 and 40 years, equally distributed in both sexes. In pregnant females the tumor may so encroach upon the pelvis as to demand caesarean section

Longcope W T: Susceptibility of Man to Foreign Proteins. *Am J Sc* 1916 ciii, 625

The introduction of foreign proteins is followed by the production in the body of antibodies which may unite with the original substance or antigen to produce a new effect. This is shown in the body by anaphylaxis.

The types of anaphylaxis are as follows (1) active anaphylaxis — the condition produced after a second injection of foreign protein which is given at least nine to fourteen days after the first injection and is shown by immediate illness or even death (2) passive anaphylaxis — a condition in which the blood of an animal sensitized to a given foreign protein may confer this sensitiveness to a normal animal (3) anti-anaphylaxis — in which for a short period following the anaphylactic shock the actively sensitized animal becomes insensitive to the infec

tions of the given protein (4) a refractory condition produced by repeated injections at intervals of two or three days, so that for a long time no anaphylactic symptoms are produced.

The foreign protein most often given man has been horse serum. The primary injection produces no immediate symptoms, but at any time after an incubation period of six days, serum sickness may appear. The symptoms are quite characteristic skin eruptions with intense itching preceded by glandular enlargement usher in the attack. urticaria is most common. oedema which may be general but usually of the face and ankles. elevation of temperature, with malaise and headache with prostration rarely nausea and vomiting. Joint pains are common in severe cases and are always multiple. There is little tenderness and no swelling or reddening. The spleen is sometimes enlarged, and in 5 to 10 per cent of the cases there is albuminuria. In the blood there is a primary polymorphonuclear leukocytosis, subsequent leucopenia and an absolute increase in lymphocytes. The disease lasts twenty four hours to twenty days or longer.

The disease is not usual after small doses but is common after large ones. The statistics of Weaver based on 801 cases, show an incidence of 10 per cent after the injection of one to 10 ccm. of serum. Most of the attacks are mild, but the incidence increases until after doses of 90 ccm. or more, 75 to 100 per cent of the patients develop serum sickness. The incidence may also depend upon the source of the serum. Apparently certain horses yield a serum which is more likely to be attended by serum sickness. The individual characteristics of the patient plays a rôle, as similar doses have different effects in different persons.

A second dose before the onset of serum sickness is not attended by immediate symptoms, but after the onset or after ten days there may occur (1) local immediate reaction, with fifteen minutes to an hour at the site of injection, oedema, erythema, or urticaria. (2) general immediate reaction, within twelve to twenty four hours such symptoms as dyspnoea of asthmatic type, cyanosis, collapse, nausea and vomiting and suppression of urine. (3) the accelerated reaction in which the incubation of the serum sickness lies between the immediate reaction and the ordinary reaction and comes on in three to five days. (4) the second injection may be followed simply by the normal form of serum sickness.

At about the time the sensitiveness appears there appears in the blood serum precipitins of the foreign protein, and a substance which is capable of transmitting the sensitive state passively from one animal to another. This latter substance is variously designated immune subunit or anaphylactic antibody anaphylactin all agree.

With the appearance of the symptoms, these antibodies and immune reactions disappear. They appear with great intensity at the subsidence of the attack. The serum or antigen during this entire

period may be demonstrated in the blood. The onset of serum sickness is probably therefore a visible evidence of the development of general sensitiveness and represents a more or less violent reaction between the circulatory antigen and antibody which is in the process of development in the cells and possibly in the blood. It is followed by a rapid expulsion of the antibodies into the circulation and shortly afterward by a period of hypersensitiveness at which the reinjections of serum may cause a violent general reaction. Later the period of hypersensitiveness diminishes and the antibodies may disappear from the circulation. The injection of serum at this time does not produce an immediate general effect but excessive antibody formation under these circumstances is much more rapid than in the normal individual, and the general reaction or accelerated serum sickness appears. Finally with complete loss of sensitiveness the individual returns to the normal state and the reaction is of normal type.

Spontaneous sensitization in man occurs not infrequently. The sensitiveness to foreign proteins exists without the known introduction of these proteins. Following the first injection a violent immediate reaction or even death may occur. This has been shown in the use of antitoxin. The urticaria following the ingestion of certain foods are explained in this way. Hay fever is an example of protein sensitization, as are also the gastrointestinal disturbances dependent upon sensitization to eggs which is not uncommon in children and may occur in adults. The sensitization to cow's milk, and instances of hypersensitiveness to the stings of insects.

An analysis of the conditions of sensitiveness in these patients shows that they differ in some respects from the artificially sensitized. The degree of hypersusceptibility is usually much greater in the spontaneously sensitized. The sensitization is usually multiple and the method of sensitization is problematical. There is a tendency for it to occur in certain families such as those showing a tendency to asthma and hay fever or susceptibility to certain foods, and suggests that there is an unknown factor here which is absent in those subjected to artificial sensitization.

Individuals in this state of spontaneous sensitization suffering from the effects of contact with protein ordinarily harmless must be differentiated from the normal individual who becomes ill from the absorption of one of the poisonous products which may be split off from the protein molecule.

The problem now turns to a different form of susceptibility namely allergy a changed reactivity or hypersusceptibility to infection. This has been studied during the last few years by the use of bacteria or their extracts which give an altered local reaction to the conjunctival subcutaneous or intracutaneous injection. Of these reactions that of tuberculin is most familiar. Similar specific reactions have been obtained with the extracts of

bodies of the infecting bacteria in such diseases as glanders, typhoid syphilis, the trichophytic infections, and labor pneumonia. The reaction in these diseases appears either during the course of the infection or after recovery. The pathology of all these reactions is quite similar consisting mainly in the infiltration of the subcutaneous tissues by mononuclear cells which are collected about the blood vessels.

Many of these conditions have been ascribed to sensitization likened to anaphylaxis and accepted as such. Bacteria contain nucleoprotein and it cannot be doubted that it is possible to produce anaphylaxis, with bacteria or their products though the toxicity of these suspensions and extracts is often so great that it is questionable whether the effect is that of anaphylactic shock or some other form of rapid intoxication. Considerable more experimental work must be done before this is proved.

HENRY J. VAN DEN BERG

SERA, VACCINES, AND FERMENTS

Hurwitz, S. H. and Meyer K. F.: Studies on the Blood Proteins the Serum Globulins in Bacterial Infection and Immunity *J Exp Med* 1916 xlv 515

The authors draw attention to the fact that for a number of years much study has been devoted to the origin and the chemical nature of the anti bodies which may develop within the organism during the course of an infection, or which may be elaborated within it by the various methods of immunization. The efforts to establish the chemical identity of antibodies have naturally they state been centered about a study of the possible relationship subsisting between the proteins of the blood and the immune bodies demonstrable in it by various serologic tests. He speaks of the great stimulus to these investigations which has come from the discovery of new methods of separating and of chemically identifying the different fractions which go to make up the blood proteins. Of these additions, the method introduced by the Hofmeister school, of separating the various protein constituents by fractional precipitation with different salts seems to have produced the most far reaching results.

They therefore carried on a series of observations on serum proteins by the inoculation of bacterial endotoxins and inflammatory irritants believing that the only satisfactory method of procuring reliable data on the globulin-antibody problem was to make quantitative estimations of the immune bodies and of the blood proteins, not at random periods during the experiment but at frequent and well-timed intervals during the process of immunization. In this way alone did they consider it possible to determine whether an increase in the antibodies and in the globulins parallels one another or whether either the globulin content or the concentration of immune bodies may increase independently of one another.

The experimental evidence presented here does not support the views held by a number of workers concerning the relationship of the blood globulins to the resistance developed in bacterial infection and immunity. From a large number of observations, continued over a long period of time, the authors have become convinced that other causes are responsible for the rise in globulins observed in these conditions.

Their observations have shown with considerable certainty that a heaping up of globulins in the blood during the development of an infection is more apt to occur in those instances where the infection has been overwhelming and associated with extensive anapuration and wasting. They have found, in fact that animals which succumb to such an acute process have usually developed only a moderate resistance as far as the development of immune bodies is concerned. On the other hand, a mild chronic infection they believe may continue over a long period of time, and may register only slight changes in the blood globulins until the animal begins to emaciate and lose in weight.

The authors conclude that the progress of an infection is usually associated with marked changes in the serum proteins. There may be an increase in the percentage of the total protein during some stage of the infection they believe and there is usually a change in the albumin globulin ratio with an increase in the total globulins. This rise may antedate the development of any resistance by a considerable period of time. The non protein constituents of the blood, they say show fluctuations with a tendency to rise as the infection progresses.

In their observations the process of immunization was in almost all instances associated with a definite increase in the globulins of the blood, and in some cases with a complete inversion of the normal albumin globulin ratio which may be produced both by living and dead organisms and by bacterial endotoxins. Massive doses usually resulted in an upset which showed no tendency to right itself during the period of observation. A rise in the globulins was shown to occur long before the animal developed immune bodies in any appreciable concentration and where the globulin curve and antibody curve appeared to parallel one another it could be shown by a careful analysis of both curves that there was a definite lack of correspondence at various periods of the experiments. Animals possessing a basic immunity showed a more rapid rise in the globulin curve following inoculation.

There was no parallelism between the leucocytic reaction and the globulin reaction. During periods of leucopenia the globulins might be as high as during the period of a leucocytosis.

Bacterial endotoxins produced as striking an increase in the serum globulins as living and killed bacteria. This seemed to indicate to the authors that a bacterial invasion of the organism is not absolutely essential for the globulin changes and that the toxigenic factor in infection and immunity must

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In their observations the process of immunization was in almost all instances associated with a definite increase in the globulins of the blood, and in some cases with a complete inversion of the normal albumin-globulin ratio which may be produced both by living and dead organisms and by bacterial endotoxins. Massive doses usually resulted in an upset which showed no tendency to right itself during the period of observation. A rise in the globulins was shown to occur long before the animal developed immune bodies in any appreciable concentration and where the globulin curve and antibody curve appeared to parallel one another it could be shown by a careful analysis of both curves that there was a definite lack of correspondence at various periods of the experiments. Animals possessing a basic immunity showed a more rapid rise in the globulin curve following inoculation.

There was no parallelism between the leucocytic reaction and the globulin reaction. During periods of leucopenia the globulins might be as high as during the period of a leucocytosis.

Bacterial endotoxins produced as striking an increase in the serum globulins as living and killed bacteria. This seemed to indicate to the authors that a bacterial invasion of the organism is not absolutely essential for the globulin changes and that the toxigenic factor in infection and immunity must

play a part in the production of the changes noted.

Inflammatory irritants injected intraperitoneally also resulted in a globulin increase. In this case, the changes produced may best be explained they state by the toxic effect produced by the protein split products resulting from the inflammatory condition.

Intraperitoneal injections of killed bacteria gave rise to a more rapid increase in the serum globulins. The rapidity of the response following intraperitoneal as compared with intravenous injection the authors believe, doubtless stands in intimate relationship to the neutralizing power possessed by the blood serum and perhaps to the more extensive surface of absorption following injection by the intraperitoneal route.

GEORGE E. BAILEY

Williams, B. G. R. A Four Years Study of the Kelling Hemolytic Test. *Med. Res.* 9 6 1 38.

In 90 tests, the results have been so convincing as to cause the author to come to the following conclusions: (1) When properly applied and interpreted, the Kelling test is of value in the diagnosis of cancer and especially in the differential diagnosis of benign and malignant abdominal neoplasms. (2) As a routine procedure for the diagnosis of all cancers in all stages it is practically valueless and misleading. (3) The chief premise of the hemolytic test is the preventing of hopelessly developed necrotic and metastasized abdominal tumors coming to the operating table.

It is agreed that the sera of patients with late malignant neoplasms of the viscera invariably cause hemolysis of alien corpuscles, and that this hemolysis is usually prompt and marked. More interesting and valuable than this is the fact that the sera of patients with benign operable tumors do not cause hemolysis unless the test be applied very late indeed.

Kelling found that there exist in the blood sera of patients affected with malignant disease certain substances or a substance innately capable of destroying the red blood-cells of organisms not cancerous, but only to a limited extent the red cells of the cancerous patient the latter appearing to be immunized to these bodies.

Furthermore, these cancer sera rapidly hemolyze erythrocytes of chickens and other animals whereas normal sera have but little effect.

The precise nature of the cancer hemolysin has not been accurately determined. Wade has shown that it is poisonous. It is especially plentiful in cancers of the mucous surfaces—stomach, intestine, etc. It may be a toxic protein remnant. Again, it may be a salt or salts of certain fatty acids (cholesterol or sodium salts of oleic acid) which have been shown to have hemolytic properties.

The author concludes that the method is a promising one and deserves further study not so much by the research worker as by the diagnostician.

LESLIE H. LAXSON

Yanagawa, H.: The Secretion of Lymph. *J. Pharmacol. & Exp. Therap.* 9 6 1 75.

The object of the author's experiments in this study has been to throw some light upon the subject of lymph secretion and to attempt to determine how far the change in the lymph flow can be brought into relation with what is known regarding the effects of these agents on other functions. His experiments were carried out on dogs, which received a hypodermic injection of 0.3 to 0.4 gram of morphine, according to their weight and were further anesthetized by ether given as uniformly as possible by means of artificial respiration. By this means he avoided irregular breathing, which otherwise is apt to occur and invalidate the results upon the lymph flow from the thoracic duct.

The animals had usually fasted for twenty-four hours before the experiments so that the thoracic lymph might not be disturbed by the state of digestion or the nature of the food. The lymph was then always clear and free from fat, and the percentage of solids could be more readily determined.

The narcotics (ether and alcohol) increase the lymph the author states, which becomes more concentrated and of higher osmotic pressure but is reduced in its coagulability. The acceleration of the lymph flow is partly due to increased osmotic pressure and partly perhaps to a change in the permeability of the endothelial cells. The change in the osmotic pressure in blood and lymph arises from the anesthetic contained in them he believes, and the permeability may be increased by the lipid-soluble property of these narcotics.

The higher arterial pressure and the greater rapidity of the blood circulation through the organs under strophanthidin does not influence the lymph flow nor is the intracapillary pressure in the portal veins increased by it in the author's opinion. After the injection of adrenalin the lymph increases in proportion to the rise of the arterial pressure, and here the intracapillary pressure is also increased. It seemed to the author therefore, that filtration may participate in lymph formation. But other factors, particularly changes in the composition of blood may also accompany the filtration, and he has not been able to study these separately. Adrenalin does not prevent other lymphagogues from increasing the lymph.

Arsenic increases the lymph the author states, which undergoes the same changes as under the lymphagogues of the first class. The chief factor in the augmentation of the lymph is the increased permeability of the capillaries of the abdominal organs, and not any increased activity of the thoracic cells. Diphtheria toxin, he found, augments the lymph greatly with the changes in its composition characteristic of the lymphagogues of the first class. But the arterial pressure rises, while under these lymphagogues it falls. The acceleration of the lymph flow he thinks follows from the greater permeability of the capillaries, and from a rise of the capillary pressure.

Calcium chloride did not reduce the lymph flow under normal conditions, but acted in the same way as the other salts. Calomel and its double salts injected subcutaneously did not cause any significant hydremic plethora and did not increase the lymph.

The intravenous injection of acids (lactic acid, oxybutyric acid) in quantities insufficient to cause marked poisoning did not affect the lymph flow. The effect of alkalies (sodium bicarbonate, lime water) cannot be distinguished from that of neutral salts, the author states. Pilocarpine increased and atropine reduced the activity of liver-cells as measured by the bile flow and the lymph after pilocarpine was augmented while after atropine it was sometimes increased and sometimes unchanged. Quinine had no distinct effect upon the lymph flow, except when sufficient was given to cause fatal intoxication. Thus though it may reduce the lymphagogue effect of glucose (Asher) this may arise, the author believes from its action on the circulation and not from any specific action on lymph flow.

The flow of the lymph does not always run parallel to that of the bile. Yanagawa states sometimes they are influenced in opposite directions. In particular the lymphagogues of Heldenstein's first class (peptone, diphtheria toxin) diminished the bile production and most of those belonging to the second class (concentrated solution of sodium sulphate or glucose) had no effect on the bile production or reduced it which is contrary to Asher's view of the lymph formation. The lymphagogues are not always cholangagogues, and as the author states other factors besides the activity of the organs must play roles in the formation of lymph.

The origin of lymph is the fluid in the lymph spaces, and any factor which alters the physical conditions and the chemical properties of this fluid must affect the lymph formation. The most important of these factors Yanagawa states, are the metabolic activity of cells, which bathe in the fluid of the lymph spaces, and the permeability of the endothelial cells which surround the lymph spaces. Both of these are influenced by changes in the blood but these changes need not always run parallel to each other he thinks. Under normal conditions if the permeability of the endothelia is constant, the metabolic activity of the tissue cells determines the exchange of solids and water by constant changes in the osmotic pressure. But, he states if the amount of fluid permeating the endothelia is altered by mechanical or physicochemical changes in the circulation the fluid in the lymph spaces and the lymph flow is altered in correspondence with this factor and quite independently of the activity of the tissues.

GEORGE E. BAILEY

Ward H. C.: A Sero-Enzyme Study of Bacterial Proteins. *Intern. M. J.* 1916 xliii, 978.

An attempt was made by the author to apply the Abderhalden reaction to the diagnosis of diphtheria and gonococcal protein intoxications. Rabbits

were treated with dead bacteria, and the blood was examined by the dialysis method using these bacterial proteins as antigens. He found that the sero-enzyme test was of no diagnostic value in bacterial infections.

MAX KAMM.

BLOOD

Simonds, J. P.: A Study of Low Blood Pressures Not Associated with Trauma or Haemorrhage. *Arch. Int. Med.*, 1916 xviii, 848.

In the course of studies on anaphylactic shock in the dog it was found that during the period of low blood-pressure the pressor effect of nicotine may be greatly augmented at a time when epinephrin produces little or no result. Exactly similar reactions were found in peptone shock. Low blood pressures from hemorrhage are sharply distinguished from the above by the fact that in them, while the effect of nicotine may be exaggerated that of epinephrin remains unchanged.

It was suggested in connection with the study of anaphylactic shock that the augmented action of nicotine in that condition was due largely if not entirely to its effect on respiration. Further observations on this point are reported by the author partly because they may have some bearing on the question of the effect of respiration on blood pressure, and partly because they may find practical application in the treatment of certain forms of shock.

The technique employed was as follows. The animals were anesthetized with ether. A cannula in the carotid or femoral artery was connected with a mercury manometer. A second cannula in the femoral vein was connected with a burette containing physiologic salt solution with a pinch-cock on the rubber connection immediately above the cannula. Standard doses of nicotine (1 ccm. of 1:4,000 solution) and of epinephrin (1 ccm. of 1:20,000 solution) were administered by inserting the needle of the syringe into the rubber tube immediately above the pinch-cock. After being injected into the tube, the drug was quickly and completely washed into the vein with from 6 to 8 ccm. of salt solution.

Simonds's study seems to demonstrate that the condition of low blood pressure due to anaphylactic shock and peptone poisoning is characterized by absence or marked diminution of the reaction to epinephrin and an exaggerated response to nicotine. It would appear that there is a condition of reduced irritability on the part of the vasomotor center and that the increased reaction to nicotine is largely mechanical, resulting from the effect of the drug on respiration. The dyspnea so produced causes suction on the overfilled non-collapsible veins of the liver and brings sufficient blood to the under-filled right side of the heart and ultimately to the systemic vessels in which the pressure is raised. It is suggested that in cases of shock to man associated with low blood-pressure not due to hemorrhage, the artificial production of dyspnea or the

voluntary increase of the rate and depth of respiration by the patient may lead to improvement

GEORGE E. BRILLY

Henschen, K. Reinfusion of Blood from the Thoracic and Abdominal Cavities After Severe Hemorrhages. *Zeitschrift für Chirurgie* 96 N. 6.

During the last two years the author has endeavored to discover if it was possible in cases of severe hemorrhages into the thoracic and abdominal cavities to reinfuse the blood remaining fluid in these cavities into the blood vessels of the patient. Contrary to what may be believed this reinfusion did not cause any damaging influence on the whole organism inasmuch as it gives to it not only healthy and functioning erythrocytes but a notable quantity of serum as well.

The technique is simple. The fluid blood is drawn off by a metallic paraffinated ladle and filtered through a piece of sterile gauze impregnated with liquid paraffin and is gathered into a glass receptacle having the internal surface paraffinated. To still better prevent any subsequent coagulation citrate of soda is added in the proportion of 0.2 to 100 ccm. By means of an ordinary transfusion apparatus the blood after being diluted with physiologic solution or Ringer's fluid is injected into the veins of the patient. The few cases treated thus by Henschen, by their favorable exit invite further study and application of the method.

W. A. BRIDGMAN

Kahn A. An Apparatus for the Direct and Continuous Transfusion of Blood. *Med. Rec.* 96 675

The author describes an apparatus which he has devised with the view of simplifying transfusion by the syringe method.

The advantages claimed over the hitherto described methods and devices are that there are no rubber parts the instrument being entirely of metal there are no joints to harbor infection or possible favorable localization for clotting. The instrument is simple in construction and requires no special technical knowledge to use it. It can be operated if necessary by one man.

The apparatus consists of a crossbar or gallows placed upon two upright rods. The crossbar is made fast to one of these upright rods at one end, and at the other is slotted so that it can be widened or shortened at will, thus graduating it to a table of almost any width. The two vertical rods holding the crossbar are held in two clamps respectively one at each side so that they can be fastened firmly by hand screws to the table. The gallows is grooved in two places the grooves being made for a spring slot which closes on the neck of the needle. The needles are about six inches long and are so curved that the point of the needle is nearly at right angles to the head. The caliber of the needle is made just snug enough for the insertion of the tip of a record syringe at its top or a metal stopper of the same

diameter. The needle is held firmly in the slot. For continuous transfusion four needles are used.

LUCIAN H. LAMOREY

Ulrich A. J. The Kimpton Brown Method of Blood Transfusion. *Indianapolis M. J.* 1916 xix, 485

The author after performing transfusion on about twenty five or thirty dogs, reports eight cases of transfusion successfully carried out on the human with the Kimpton Brown tube.

He deviates a little from the original in the method of preparing the tube, by leaving the tip or outlet of the Kimpton Brown tube uncoated with paraffin, as this tends to clotting by reducing the caliber of the already small outlet. As a substitute for the paraffin he places two cubic centimeters of steril liquid vasoline in the tip before it is inserted into the vein of the donor.

LUCIAN H. LAMOREY

Levison, C. G. The Present Status of Blood Extract Constituents and Blood Transfusion. *M. J.* 5 ser 96 xix 65

Levison recommends transfusion as a pre-operative measure in chronic jaundice and in patients who have suffered from slow hemorrhage. In advanced carbon monoxide poisoning and advanced surgical shock transfusion is valueless.

In hemorrhagic blood diseases such as purpura hemorrhagica, hemophilia, and melena neonatorum he states that transfusion is at times very effective, but in chronic and pernicious anemias it has achieved no important results.

Injections of from 10 to 30 ccm. of whole blood is almost a specific in melena neonatorum.

Intravenous injections of gelatin and gum acacia afford excellent substitutes for the loss of blood as a result of hemorrhage and should be more generally employed.

Injections of whole blood intramuscularly are more effective than horse serum in controlling bleeding but local applications of horse and rabbit serum may at times be effective in controlling bleeding if human serum is without effect.

Kephalin and coagulin are of great importance for their local effects as hemostatics. Kephalin acts almost specifically when applied locally to the wounds of hemophilia.

Levison prefers Unger's modification of Lindeman's method on account of its simplicity and ease of employment but he also recommends the Lewishohn method and the use of the Kimpton-Brown tube.

ALBERT DUNSTON

Vincent B. Blood-Transfusion with Paraffin-coated Needles and Tubes. *Surg. Gynec. & Obst.* 96 xix, 6

The author has used a glass tube or flask with a paraffin coating which inhibits the coagulation of blood and allows ample time to transfer it from donor to recipient.

The tube is a cylinder with a capacity of 300 ccm.

the upper end of which is closed with a rubber cork. About 3 cm. below the end is a side opening where connection is made with a bulb syringe which is used to express the contents of the tube. The lower end of the cylinder terminates in a glass tip through which the blood enters and leaves the tube about 2 cm. above the end of the tip is a ground glass joint by means of which a tight connection can be made with the needle.

The needle is 6 cm. long and consists of a shaft and a socket of about equal length. The socket which is the special feature of the needle is made of an unusual depth so that there is no contact between the needle and that portion of the glass tip which projects into the socket below the ground glass joint. The needle is made in two sizes number 14 and 16 gauge.

The tubes are cleansed with hot water wrapped in a towel with the cork and a short piece of rubber tubing and sterilized and dried in the autoclave. The process of coating the tubes with paraffin is then carried out under aseptic conditions. The commercial article sold under the name of parowax serves all practical purposes.

The needles are cleansed, dried and heated until sterile in a dish of melted paraffin. With sterile forceps a needle is then taken from the dish and the excess of wax is removed by shaking or by blowing air through the needle with a bulb syringe during the process of cooling to prevent the formation of a plug of wax in the lumen.

In most transfusions the veins of the donor are large and easy to puncture with the needle while the veins of an anemic recipient are apt to be small and hard to locate. For this reason it is usually advisable to take the blood from the donor into the tube by means of the needle then disconnect the needle from the tube and inject the blood into the recipient through the glass tip which is inserted directly into a small vein previously exposed by skin incision.

The average transfusion requires at least 600 ccm. of blood. In most cases, if a hematoma does not form around the vein, it is possible to take two and sometimes three tubes of blood from the same vein by reinserting the needle through the original skin puncture. It is not necessary to use a fresh tube and needle for each transfer of blood. If cleansed immediately with cold salt solution they may be employed a second or even a third time in the same transfusion. A single tube and two needles usually suffice for a transfusion although one should always be prepared with at least two coated tubes and extra needles.

This needle and tube method without incision applies especially well to the infant with an open anterior fontanelle where the blood is injected into the superior longitudinal sinus.

One-half a tube or 150 ccm. of blood is sufficient as the amount required to transfuse these cases varies from 90 to 120 ccm.

The chief disadvantage of this method of trans-

fusion lies in the preparation of the needles and tubes, but this process is not difficult and may be done in advance. The coated needles and tubes can be kept indefinitely and are always ready for immediate use. In practice the method is certain and flexible. The combination of needle and tube allows the surgeon to make a choice of procedures to suit his own operative experience and the need of the individual case. The tube with open incision is a sure method for any transfusion and under favorable conditions, the use of the needle with the tube simplifies the operation. EDWARD L. CORNELL.

Lewisohn R.: The Importance of the Proper Dosage of Sodium Citrate in Blood Transfusion. *Ann Surg Phila.* 1916 liv 618.

On account of its simplicity the citrate method of transfusion of blood will unquestionably become the generally adopted method, provided there are no real objections to its use. The author believes that it is absolutely safe. He advocates the use of 0.2 per cent sodium citrate which is the minimal dosage. There have been a number of objections raised to its use both on theoretical and experimental grounds. The chief of these is its toxicity. The author has used the citrate method in 75 transfusions with no sign of a toxic effect. Lindeman has given as much as 1,800 ccm. at one time. If such quantities of blood were mixed with 1 per cent citrate the result would undoubtedly be injurious to the patient. It seems that about 5 gm. of sodium citrate can be introduced into an adult without any risk. If a 0.2 per cent dosage were used, it would allow the administration of as much as 2,500 ccm. of blood or more than is ever utilized at one time. The chill following transfusion is just as likely to occur in cases in which the uncitrated blood has been used or in about 30 per cent of transfusions.

It has been claimed that the citrate may affect the microscopical elements of the blood, but microscopic examination does not bear out this contention. Experimentation shows that 0.15 per cent mixtures will stay fluid for at least two days. The slightest error however under this amount will cause rapid coagulation. For that reason the 0.2 per cent mixture was suggested. There is no objection to the use of slightly larger doses as advocated by Garbat (0.25 per cent) Carter (0.3 per cent) and Agote (0.25 per cent).

It is very important to use a large needle in collecting the blood as citrate and blood mix only after the blood has left the needle. For the same reason care should be taken that the position of the cannula in the vein allows the blood to flow freely.

From the work of Ottenberg and others, it appears that the coagulation time of the recipient's blood is not materially altered. The time may be shortened very markedly immediately after the transfusion but after twenty-four hours it has returned to its previous level and experience has shown that it is never lengthened. GATEWOOD.

Freund, H. A., and Mayer, W. D. Consideration of Recent Methods of Transfusion with Indications and Technique. *J. Mich. St. M. Soc.* 9 6 xv 576

In discussing the advances which have been made in the technique of the performance of transfusions, the methods of Carrel, the use of cannulas, as devised by Crile and Elsberg, the jugular vein method of Sores, the Kimpton-Brown parafinized tubes, and the syringe method of Lindeman are noted. Mention is made of the apparatus described and used by Freund, and a description in detail is given of the sodium citrate method devised by Lewishon. The Unger apparatus is also described. As to the occurrence of temperature reaction following citrate transfusion various theories are given for these reactions: (1) antigen-antibody combinations, (2) increased trypsin, (3) a decreased content of the blood, (4) the formation of a new protein in the blood. Mention was made of the amount of blood transfused and also the indications for transfusion. The amounts of blood mentioned were 70 ccm for an infant, 400 to 800 ccm for an adult. The average transfusion for an adult being about 500 cc. Excessive amounts are likely to cause pulmonary edema and cardiac dilatation.

The indications for transfusions were those formerly published by Ottenberg and Libman.

The importance of transfusion in bleeding gastric and duodenal ulcers, typhoid hemorrhage, ectopic gestation, pernicious anemia, hemophilia, and transfusion preliminary to operation upon patients with uterine fibroids and hypernephromata, which had bled previously is emphasized. The importance of preliminary agglutination and hemolytic tests upon the blood of the donor and the recipient are discussed. In emergencies, a parent, brother or sister may be used as a donor if it is impossible to perform the usual tests. In hemorrhages in the newborn, the mother's blood may be used with practically no risk. The untoward results where the tests are not made, are hematuria, development of jaundice, pulmonary edema, uricæmia, petechial eruptions, convulsions, or even sudden death in the recipient. The rare co-digestion of phagocytosis of the transfused red blood-cells by the recipient's leucocytes is noted and also the importance of a Wassermann test on all donors. The authors report ten cases of transfusion.

BLOOD AND LYMPH VESSELS

Lusk, W. C. Two Cases of Thoracic Aneurism. Wired Four Years and Thereabouts Ag. Respectively. *A. S. J. Phila.* 9 6 to 680

The author reports two cases of thoracic aneurism upon which the Moore-Corradi operation of wiring with electrolysis was performed over four years ago. In the first case seventeen feet of No. 30 gold clasp wire was used and in the second twenty two and one half feet of the same wire. In each in-

stance the operation was followed with active anti-syphilitic treatment and the patient was much improved. The pain which was present almost constantly before the operation, was relieved and was experienced after operation only upon comparatively heavy exertion.

The author emphasizes the importance of following the operation with active anti-syphilitic treatment and thinks the best results are obtained only when mercury and potassium iodide are administered several months before giving one of the salvarsan preparations.

In wiring the best result is obtained when the wire is so introduced as to bring as much as possible in contact with the wall of the aneurism. This permits the clot produced by the electrolysis to come in contact with vitalized tissue from which it can become organized. The clot is most likely to form in the aneurismal recess where the blood current is slowed to a greater extent than elsewhere.

Contact with a greater portion of the wall of the aneurismal sac is secured by bending the wire in undulating curves and then shaping it to form a series of loops, one smaller than the diameter of the sac being interposed between two larger loops.

JOHN W. TURNER.

Teacher, J. H., and Jack, W. R. Aneurism of the Hepatic Artery Rupture of Liver; Peritonitis. *Nodosa. Glasgow M. J.* 19 6 June, 77

Aneurism of the hepatic artery is a rare condition and ends by rupture and fatal hemorrhage. Where the aneurism is embedded in the liver traumatic rupture of the liver takes place. A case is given in detail as follows:

The patient, a male aged 43, a tobaccoist, had complained of swelling of the feet, breathlessness, and palpitation for the past month. He had an excessive appetite for meat, took little exercise and smoked incessantly. Specific history was denied. Past history was negative. The first symptoms began 18 months ago but yielded to treatment.

The temperature was 99° F, pulse 16 respirations 42 with orthopnea. The systolic blood-pressure was 230 with rhythmic beats but unequal force. Cardiac dullness increased, the apex beat being two inches outside the nipple line in the sixth interspace and the right border at the right edge of the sternum. There were no murmurs although the sounds were weak.

The chest was negative except for numerous dry rales at both bases. The liver was palpable one inch below the right ribs and the right lumbar region was dull, tense, and painful. There was no jaundice, no splenic enlargement and no gastric or intestinal hemorrhages.

The nervous system showed no abnormality. The urine showed abundant albumin and some casts with specific gravity 1.021 and 24-hour specimen of 30 ounces.

The clinical diagnosis was cardiovascular disease.

A complete postmortem examination showed dilatation of the left ventricle of the heart, atheroma, and thickening of the aorta and abdominal vessels.

The liver showed three small ruptured aneurismal sacs, one of moderate size in the left lobe and two small ones in the right lobe. In each the liver substance was ruptured and the clot covered by Glisson's capsule. There was a moderate-sized free clot in the upper abdomen.

The right kidney showed marked hydronephrosis while the left showed a late stage of subacute nephritis.

After a complete detailed microscopical examination the conclusion was that the condition was a comparatively acute disease of the small arteries affecting chiefly the branches of the hepatic artery and in a few instances producing aneurism.

A review of the literature shows 40 cases of aneurism of the hepatic artery 24 being extra-hepatic and 16 intrahepatic, the remainder not being stated.

In some cases there are no symptoms referable to the liver in others there is pain jaundice and hemorrhage. The pain resembles that of biliary colic while the hemorrhages are gastric or intestinal.

Fever is usually present with exacerbations corresponding to the height of pain paroxysm. The condition is usually diagnosed as cholelithiasis or duodenal ulcer.

The etiological factors are probably syphilis, gall-stones, infective embolism, and liver abscess.

P. M. CHASE.

Schwicker H.: Operative Treatment of Aneurisms in War (Operative Behandlung der Kriegsaneurysmen) *Deutsche Zeitschr. f. Chir.* 96 cxxxvi, No. 6

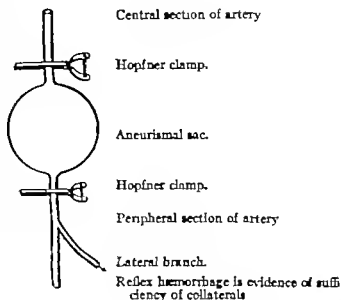
Schwicker reports upon 17 cases of war aneurisms. Of these 5 were of the arteria femoralis 6 of the arteria tibialis posterior 3 of the arteria poplitea and one each of the arteria subclavia, arteria carotis communis, and arteria carotis externa.

While suture of the injured vessel is the most important aim yet owing to the much torn vessel wall suture is often technically impossible. In such cases there need be no fear of a complete ligature of the involved vessels. It can be executed without fear of subsequent gangrene. Vascular suture was executed by the author in only two cases in one case with success and in the other with a subsequent infection which could not be overcome and which necessitated a later amputation.

He was obliged to amputate one case but on the whole his results were favorable. W. A. BRINKMAN

Dreyer L.: Testing Out of the Henle-Coenen Sign Upon a Side Branch of the Artery (Prüfung des Henle-Coenen'schen Zeichens an einem Seitenast) *Zentralbl. f. Chir.*, 1916, No. 42

At an operation for aneurism in the canal of Hunter the author endeavored to avoid the aneurism proper and proceeded as follows: Proximal to the



aneurism be laid bare the vessels and clamped off the femoral artery then the vessels in the popliteal space were isolated and a side branch running from the popliteal artery was severed and as upon severing arterial blood escaped from the proximal end of the cut branch simultaneously with the clamping off the femoral artery he felt justified in applying the simple ligature to the femoral artery proximal to the aneurism and to the popliteal artery distal to the aneurism. This showed that the collateral circulation was well established.

Not the slightest nutritional disturbance set in. The patient was able to leave bed on the eighth day and was able to walk freely.

Whether this sign will be of value in other cases remains to be determined but it seems advisable to test it out further. L. A. JÜHNKE.

Bertein, P.: Immediate Spontaneous Obliteration of the Large Limb Arteries in War Wounds (Les oblitérations spontanées et immédiates des grosses artères des membres dans les plaies de guerre) *Press. méd.*, 1916 p. 581

In time of peace in industrial accidents one frequently encounters severe injuries of the limb where a sectioned surface does not bleed owing to the immediate haemostasis of the larger vessels. Similarly in war surgery many cases are seen in which a gunshot has torn off an arm or leg and the stump does not bleed profusely or even in cases where the limb remains but the vessels are grossly injured. Thus in a shoulder fracture case observed by the author in which he practiced a scapulo-humeral disarticulation he found that although the axillary artery had been sectioned there was no need of ligature because there was a perfect union of its walls which created a complete obstacle to the flow of blood.

There are two varieties of arterial obliteration which the author distinguishes, i.e. those due to

section of the vessel as distinct from those due to its contusion. These raise different pathological and clinical problems which the author illustrates by quoting some observed cases.

From his experience the author is of the opinion that in cases of vascular sections where there is comparatively slight hemorrhage this effect is due to a mechanical action somewhat analogous to that of operative torion of the vessel the projectile when it strikes the arterial wall first ruptures the internal coat which is more fragile and secondarily ruptures the external coat. The internal coat shrivels up in the lumen of the vessel and the blood coagulum in contact with the debris forms a clot which causes an obstacle to the blood flow and which progressively becomes more solid.

In verified cases of spontaneous hemostasis the author believes that the ends of the sectioned vessel should be ligatured. He does not believe that the surgical rule which calls for double ligature in the case of sectioned vessels should be departed from in cases which are merely exceptional.

Spontaneous hemostasis after section is especially observed in injuries of the upper limbs spontaneous hemostasis after contusions are more often seen in the lower limbs. The reason is that a clot cannot habitually form in a ruptured femoral artery because its caliber is too large. The absence of spontaneous hemostasis after arterial contusions in the upper limb is perhaps only apparent.

The author discusses the effects due to spontaneous obliteration after arterial contusions in the lower limbs.

W. A. BREWSTER

Lower W. E. Hemangioma Cavernosum: Report of a Case. *Surg. Gynec. & Obst.* 9 6 xiii, 59

Hemangioma cavernosum is differentiated from other conditions which it simulates such as angioma and nevus. True hemangiomas are distinguished by large vascular spaces lined with endothelium and filled with blood. These cysts are found in situations corresponding to the embryonic lines of fusion, as the facial or branchial clefts. The mass is fed by a single artery and discharges its blood into the dilated veins.

The hemangioma cavernosum may be recognized by its purplish color and by the fact that pressure will cause it to decrease in size. When the pressure is removed the cyst will return to its former size. It is encapsulated and palpable and it pulsates. Treatment is by complete extirpation.

The author reports a case of his own in a babe of four months, who had a mass on the right side of the neck from birth. Upon its entrance to the hospital, the cyst was the size of a large lemon. It extended from beneath the scapula and clavicle almost up to the ear. It had all the characteristics of hemangioma cavernosum. By sharp dissection it was removed intact. The cyst was found to be fed by the subclavian artery.

The pathological and microscopic findings are given in considerable detail in the original.

POISONS

Bacris: Treatment of Established Tetanus by Antitetanic Serum in Massive and Repeated Doses (Traitement du tétanos confirmé par le sérum antitétanique à doses massives et répétées). *Bull. Acad. d. méd. Par.* 9 6 lxxvi, 3 6

Bacris thinks that antitetanic serum has a marvelous effect if administered in the initial stages of tetanus in fact he is convinced that it has a curative value in tetanus in any stage even where no prophylactic doses have been given. He has treated 13 cases and all have recovered. The total hypodermic dose has varied from 160 to 420 ccm. An injection of from 50 to 60 ccm. is made once daily for six days.

The treatment should be instituted on the first appearance of trismus and carried on in spite of any apparent benignity of the disease — on other medication should be employed. Massive and repeated injections of antitetanic serum prevent the grave results of tetanus they reduce the duration of the disease they make early alimentation possible.

W. A. BREWSTER

Colombino S. Are There Tetanus Bacillus Carriers? (Exist-il des porteurs de bacilles de tétanos?) *Bull. et mém. Soc. d. ch. d. Par.* 9 6 xiii 20 3

Colombino while making bacteriologic examinations in the cases of wounded men who had received preventive antitetanic injections but had not shown any tetanus found out alone spores but more or less frequently the tetanus bacillus itself. He thinks therefore, that there are tetanus bacillus carriers among the wounded and that the presence of such is a distinct danger of tetanic infection to the wounded in their vicinity. He thinks, moreover, that prior to a surgical operation on any wounded man in a military hospital an antitetanic injection should be made.

In the discussion the majority did not favor the adoption of the proposal.

W. A. BREWSTER

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Hamilton H. C., and Rowe, L. W. Pituitary Standardization. *J. Lab. & Clin. Med.* 9 6, li, 20.

The authors contrasted the effect of pituitary extract on the isolated guinea pig uterus and on the blood-pressure with the idea of pituitary standardization. They concluded that neither method in its present form is ideal as a means of standardizing pituitary extracts. Too few specimens of the guinea-pig uterus are sufficiently uniform in their reaction to the hypophyseal extract to be of service for accurate standardization. According to the authors the pressor test is a fairly accurate measure of pituitary activity is not an illogical indicator of oxytocic value and is free from some of the objectionable features of the uterine method.

MAX KARY

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Tanberg A : The Relation Between the Thyroid and Parathyroid Glands. *J Exp Med* 1916 xiv 547

The author calls attention to the fact that although the thyroid and parathyroid glands are generally regarded as independent organs, numerous observations seem to indicate a functional co-operation between them. These views are based essentially on the microscopic changes that take place in one of the glands after entire or partial extirpation of the other. Although both glands under normal conditions present different and characteristic structures they may the author states, especially the thyroid gland under various experimental conditions, undergo structural changes.

Before reporting his experiments Tanberg describes the changes that may occur in the thyroid that has not been subjected to surgical procedure. He also describes the changes that occur in the thyroid and parathyroid glands after meat diet and the appearance of the thyroid gland after parathyroidectomy and the appearance of the parathyroid gland after thyroidectomy. From his study and observations he draws the following conclusions:

1. Excessive meat diet develops hypertrophy of the thyroid gland. A definite hypertrophy of the parathyroid gland under the same conditions has not been established, and a meat diet does not develop hypertrophy of the thyroid gland when insufficiency of the parathyroid gland exists at the same time even if no clinical symptoms are present. Where a pronounced hypertrophy caused by a meat diet has already developed the hypertrophy disappears and the gland assumes its ordinary appearance after extirpation of a sufficiently large number of parathyroid glands.

2. After parathyroidectomy no hypertrophy of the thyroid gland takes place. In chronic tetany the thyroid gland seems, on the contrary the author states, to atrophy in spite of a meat diet.

3. After complete extirpation of the thyroid gland the parathyroid gland does not change its structure, even in cases where the cachexia lasts for several years the author believes, but small remaining parts of the thyroid gland may through hypertrophy develop into compact tissue and thereby seemingly present some points of resemblance to the parathyroid gland.

When the parathyroid gland hypertrophies as in some forms of chronic tetany this hypertrophy is characterized by the development of large transparent sharply defined cells with large nuclei rich in chromatin.

The parathyroid and thyroid glands are independent organs, each having specific functions. This however according to the author does not exclude the occurrence of a direct or indirect interaction in the functions of the two systems.

The author believes that there is reason to believe that an insufficiency of the parathyroid gland checks to some extent the function of the thyroid gland. No proof of the existence of a vicarious co-operation between the two glands he states has been established.

GEORGE E. BEILBY

Duceschi V : Subdiaphragmatic Section of the Pneumogastrics in Some Diseases of the Stomach (*La seccion subdiafragmatica de los pneumogastricos en algunas enfermedades del estomago*) *Presencia med argent* 1916 iii 166

The effects noted after experimental section of the pneumogastric nerves in animals vary according to different authors and the conclusions are contradictory.

The author has practiced subdiaphragmatic section of the vagus in four dogs previously operated upon for gastric fistula. He studied the digestive action of the stomach before and after the neurectomy. The section of the vagus was accompanied by the extirpation of the greater part of the gastric filaments of sympathetic origin.

As the effect of this nerve isolation of the stomach, Duceschi observed that during the first two weeks there was a retardation in the time of digestive evacuation and a diminution of the motor activity especially during fasting periods moreover a certain degree of deficiency in the chemical processes was observed. After this first period the digestive action returned to a condition approximating normal. No gastric dilatation was observed nor lesions of the mucosa.

The author says that nerve mechanisms constituted probably by the ganglionic apparatus of Openchowski exist in the stomach wall which determine and regulate its most important functions.

The result of the investigation according to the author authorizes the surgeon to practice nerve isolation of the stomach in patients with grave lesions of this organ referable to a gastroneurosis (such as painful crises generalized hypertony and pyloric spasm) when the symptomatology is very marked and medical treatment has shown itself insufficient also in forms of permanent hypersecretion and in some forms of Reichmann's disease.

W. A. BRENNAN

Lamson P D : The Role of the Liver in Acute Polycythemia. Further Observations on the Effect of Shutting Off the Arterial Blood Supply to the Liver the Reaction of the Normal Animal to Epinephrin and Removal of the Liver from the Circulation. *J Pharmacol & Exp Therap* 916 i 129.

In a previous paper the author concluded from his own experiments there reported that the liver is the organ in which the processes take place by which the number of erythrocytes per unit volume of blood is suddenly increased in acute epinephrin polycythemia. It has, therefore been his purpose in this paper to give further experimental evidence in support of this view of a new liver function.

In carrying out these experiments, polycythemia was produced by injecting in all cases epinephrin in doses of 0.9 mg per kilo body weight in the femoral vein.

The author's experiments showed that when the liver was functionally removed from the circulation by shutting the portal blood around it by means of an Eck fistula, and ligating the hepatic artery the intravenous injection of epinephrin caused no increase in the number of erythrocytes per unit volume of blood.

They further showed that ligation of the hepatic artery previous to the injection of epinephrin prohibits the increase in the number of erythrocytes which normally occurs after the intravenous injection of this substance and that removal of this ligature some time after the injection is followed by an increase in the number of erythrocytes often as great as though a second dose of epinephrin had been injected into the animal.

This failure of the animal to respond to the intravenous injection of epinephrin by an increase in the number of erythrocytes when the hepatic artery is previously ligated, is explained in the following manner:

It is probably not due to the reduced oxygen supply to the liver he states as other processes which are dependent upon the presence of oxygen as the transformation of glycogen to sugar, the formation of bile, and the secretion of phenolphthalein by the bile, take place when the arterial blood supply to the liver is shut off.

Nor does he believe it to be due to the lack of high arterial pressure in the liver as polycythemia, he states, is quite independent of the blood pressure and as the injection of epinephrin into the portal vein when the hepatic artery is ligated is immediately followed by a marked increase of erythrocytes per unit volume of blood.

From these facts he concludes that the failure of the animal to respond to the intravenous injection of epinephrin by an increase in the number of erythrocytes when the hepatic artery is ligated is due to epinephrin not reaching the liver in sufficient concentration to bring about this phenomenon, on account of having first to pass a capillary area.

The author reports in this paper further observations on the effect of the intravenous injection of epinephrin in varying doses in cats and dogs, and offers his experiments as further evidence that the liver is the organ in which the processes take place, by which the number of erythrocytes per unit volume of blood is increased in acute epinephrin polycythemia.

GEORGE E. BAILEY

Carrel A., and Hartmann, A. Cicatrization of Wounds; the Relation Between the Size of a Wound and the Rate of Its Cicatrization. *J Exp Med* 9 6 xxi 439.

In the course of experiments made by Carrel in 1908 at the Rockefeller Institute certain relations existing between the size of a wound and the rate of

cicatrization were studied. The experiments showed that the rate of repair was greater at the beginning than at the end of cicatrization, and depended not on the age of the wound but on its size, being directly proportional to it. The object of the experiments reported in the present paper was to find a technique by which the size of a wound could be measured accurately to ascertain whether the curve representing the cicatrization was geometric in form, and to study the relations between the size of a wound and the velocity of repair as well as the relative importance of the processes of contraction and epidermization.

The experiments were made in the following manner. In the sternal region or in the anterior abdominal region of anesthetized guinea pigs and cats, wounds were obtained by the resection of a strip of skin geometric in form. In order that the edges of the cicatrix might be seen distinctly animals with a black skin were used or the edges of the wound made on white animals were tattooed with India ink. The skin of the cat and, as has been previously noted by the author, of the dog not being adherent to the aponeurosis, errors occurred in the measurement, if in consecutive observations, the animal was not placed in an identical position. The guinea pig was generally employed because the skin of the abdominal wall of this animal is more adherent to the aponeurosis than that of the cat or dog. In human beings wounds of regular shape were selected, located on patients confined to bed. When both the wound and the cicatrix were to be studied, cases were chosen in which the outer edge was well colored and easily discernible from the surrounding skin. Observations were also made on the healing wounds of soldiers.

The wounds observed by the authors which observations were made on men and on guinea pigs, were in a condition of slight infection and healed both by contraction and by epidermization.

The curves representing the progress of cicatrization in these experiments assumed a geometric appearance. It seemed probable to the authors, therefore, that the relation between the size of a wound and the rate of repair might be expressed mathematically.

The regularity of cicatrization depends, the authors state in a large measure on the bacteriologic condition of the wound and the more aseptic the wound the more regular the curve of cicatrization. In the first experiment the wound was aseptic during the greater part of the period of repair. Agar and bouillon inoculated with the secretions of this wound remained sterile. In the other experiments the wounds were slightly infected. After a wound was chemically sterilized the rate of cicatrization increased.

When an aseptic or slightly infected wound was infected the curve of cicatrization became horizontal or infected upward, showing that arrest or retrogression of the repair occurred. In the following experiment a wound accompanying a fracture of the

humerus had been almost completely sterilized and was cicatrizing normally when a slight infection occurred. Cicatrization stopped and the wound enlarged.

Briefly summarized the authors' conclusions are as follows:

The rate of cicatrization of a wound is greater at the beginning than at the end of the period of repair. It depends on the area rather than on the age of the wound. There is a constant relation between the size of the wound and the rate of cicatrization. The larger the wound, the greater is the rate of cicatrization. Two wounds of different size have a tendency to become equal.

The rate is proportional to the area, but diminishes less rapidly than the area.

The process of contraction is the most important factor in the repair of a wound. Epidermization completes the work of contraction. After the wound is healed, the cicatrix as a rule expands.

The curve representing the diminution of the size of an aseptic wound while it cicatrizes is regular and geometric.

GEORGE E. BELL

Du Nouy P. L. Cicatrization of Wounds: Mathematical Expression of the Curve Representing Cicatrization. *J Exp Med.* 1916 xiv 451

In order to study the process of cicatrization, a technique for measuring accurately the area of wounds was developed. Sterilized cellophane was applied to the wound and the edge was outlined with a wax pencil. This drawing was transferred in ink to an ordinary sheet of paper and afterwards the area was measured by means of a planimeter either the Amsler system or some other. A curve was obtained by carrying the area, in square centimeters in ordinates, and the time, in days, in abscissae.

In many experiments made by Carrel the author notes that the curve representing the cicatrization of aseptic wounds was of regular and geometric appearance and these curves were expressed by a mathematical equation in function of time and area.

After a large number of slightly infected wounds had been studied by the author, a simple extrapolation formula was obtained. Marked deviation from the calculated curve showed generally that infection had set in. By means of the formula the area of the wound after a given time could be foreseen.

The cicatrization of sterile wounds the author states, may be studied in the same way as an ordinary physicochemical phenomenon. It is possible therefore he says, to express the law of cicatrization by a mathematical equation as soon as an accurate measure of the wound can be obtained and by means of the equation, a curve can be obtained which represents the theoretical evolution of the cicatrization of a wound. This curve being an expression of what should happen on a normal wound healing aseptically on a normal man can be

used as a daily point of comparison to what actually appears on the observed wound and allows the fluctuation or cicatrization on a given individual and the action of different dressings and antiseptic substances to be studied accurately.

GEORGE G. BELL

RADIOLOGY

Hesnard A.: Treatment of Lesions of the Nerve Trunks by Radiotherapy of the Nerve Cicatrices (Le traitement des lésions des troncs nerveux par la radiothérapie des cicatrices nerveuses). *Arch. d'Elect. Méd.* 1916 xiv 305

Hesnard states that the method of treating nerve-lesions by deep radiotherapy of the nerve cicatrices has been little studied. The statistics of cases treated in this way are clearly superior as regards percentage of recovery and amelioration to those of all other methods even when applied to old lesions.

The operative technique consists of directing very penetrating and filtered rays through the teguments and perineurios adhesions to the nerve scars, in sufficient dosage and at short intervals.

The clinical signs manifested are those of the reparation of the nerve functions: there is more or less complete retrogression of all the symptoms and this occurs in a manner absolutely similar to spontaneous reparation but with greater rapidity.

Animal experimental research confirms these results. The X rays act especially by modifying perineurios adhesences. The action on the nerve itself and on the conjunctive tissues is less evident. The action is shown macroscopically by a softening of the adhesences and of the induration of the nerve and histologically by a retrogression of the organized fibrous tissue to the embryonic state.

The X ray treatment is especially indicated in recent lesions and particularly where there are extensive losses in the soft parts. Old lesions are susceptible of amelioration. All lesions treated surgically and showing evidence of reparation are amenable to X ray treatment.

The treatment is contra-indicated when the anatomical situation renders the lesion inaccessible or when it is made so by a bony callus also in old lesions due to complete section of the nerve without any signs of spontaneous reparation. There does not appear to be any danger. Interstitial hemorrhage, secondary sclerosis, or nerve degeneration are dangers which appear to be more theoretic than real.

W. A. BRENNAN

Hugh W. K.: Diathermy; Its Use in Surgery. *Med. J. Austral.* 1916 ii, 89

The author's experience has been limited to inoperable carcinomata of the mouth, fauces, larynx, and oesophagus and he has been more than satisfied with the results. The most striking effect is the disappearance of pain. Anyone who has not had experience with it would scarcely believe that a large foul ulcer of the floor of the mouth or the ton-

sil would be replaced by a soft cicatrix and remain sound for months or even years. Besides definitely inoperable cases all those that are on the border line of possible removal by surgery should be first treated by diathermy.

The following non-malignant cases have been successfully treated with diathermy: fibroma of the nasopharynx; naevi, both superficial and deep (it has been especially successful in pulsating naevi); lymphangioma; papilloma of the bladder and larynx; senile warts; epulis. EDWARD L. CORNWELL.

MILITARY SURGERY

Pollock, A. The Phenomena of Proteolysis in War Wounds (*Les phénomènes de protéolyse dans les plaies de guerre*). *L. A.* 9 6 xiii 647

The evolution of wounds is a function of two groups of factors: the phenomena of disintegration and the phenomena of reformation of tissue. The former dominate the general pathology of the first stages of wounds. The anatomopathologic processes of necrosis, mortification, sphacelation, etc. should be included in the category of the biochemical phenomenon of proteolysis; that is to say the setting free of large protoplasmic albuminoid molecules by proteolytic diastases.

In order to activate proteolysis the best physiologic means is the favoring of the presence of polynuclears which are essentially the best proteolytic elements. The author formulates two conditions for practical surgery to accomplish this end in treating wounds.

During the initial period of the clearing of wounds the point to aim at is to limit proteolysis topographically but to extend it chemically as far as possible. In this period besides the utilization of artificial digestive fluids, leucocytary afflux can be favored by the employment of serums. The employment of antiseptics will prevent the formation of microbial toxins without hindering leucocytary proteolysis. Absorption of intermediary toxic products of proteolysis will be prevented by lymphatic drainage (hypertonic fluids) by the frequent renewal of dressings or by aspiration.

During the reconstitution period proteolytic phenomena should be avoided. Leucocytary afflux should be suppressed. Leucocyte destruction is preventable by avoidance of antiseptics, employment of isotonic solutions and dry dressings. Proteolytic diastases can be checked by heat or heliotherapy.

The author while admitting that the suggestions are theoretical, thinks it is for clinicians to demonstrate their practical value. W. A. BRIDGMAN.

Jernst, I. Statistics of 1000 War Operations (*Sur un statistique de 1000 opérations de guerre*). *B. H. et méd. Soc. d. chir. d. Par.* 9 6 xiii, 495.

Le Jernst gives a summary of his personal statistics of operations carried out under his care during the two years of the war. The last com-

prises among others: 5 projectile extractions; 94 hernias; 93 severe phlegmons; 29 large resections; 4 osteitis; 0 infected brain or cranial lesions.

The global mortality was 2 per cent. The most frequent causes of death were: infected lesions of cranium and brain, 2.2 per cent; thoracotomies, 3.5 per cent; purulent arthritis, 17.6 per cent; gaseous gangrene, 14.3 per cent. In the case of patients sent directly to the rear for treatment, the percentage of mortality is considerably higher than in the case of men whose wounds are cleared immediately and kept under observation for some days before being sent to the rear hospitals. The comparative mortality of these two classes is 3.14 per cent and 0.83 per cent respectively. There is a general agreement of opinion as to the necessity of immediate care of the wounded at the front, and the figures now quoted are a very eloquent tribute to its efficacy. W. A. BRIDGMAN.

Quénu, E. Treatment of War Wounds. *Anti-sepsis* (*D. 1. traitement des plaies de guerre de l'antiseptique*). *B. H. et méd. Soc. d. chir. d. Par.* 9 6 xiii 78.

Quénu dissents from the views recently expressed by Sencert regarding the sufficiency of surgery alone in the treatment of wounds without the necessity of antiseptics. While there is more or less general agreement as to the necessity for surgical intervention for the removal of foreign bodies, dead and dying tissues, to Quénu thinks that this scarcely justifies in all cases the rigorous execution recommended by Sencert of making large removals as in the case of tumors. He believes that while resection of contused parts and removal of fragments is an excellent principle it should be confined within reasonable limits and no greater openings made nor extractions sought than are obviously indicated.

As regards antiseptics, Quénu thinks that while in most cases the wounded treated surgically only may be evacuated from the hospital in an apparently good state yet in many cases within a short time inflammation and infectious complications will appear. Primary surgical disinfection in such cases has postponed the appearance of such complications. It has undoubtedly diminished their intensity but it has not suppressed them.

Antisepsis does not consist alone in bathing a wound in an antiseptic fluid which pretends to be microbicidal. To expose wounds to the sunlight, to douche them with warm water to submit them to electric rays, to spread antibodies on their surface, to directly or indirectly excite phagocytosis—these are procedures to effect antisepsis. All these methods enter into antisepsis since they tend to obtain the disinfection of a septic wound and to them may be added methods of treating the general circulation under the form of subcutaneous or intravenous injections which act on the microbes or their toxins. Of all such methods Quénu insists particularly on two: the method of Carrel and the serum therapy of Leclainche and Vallée from which he has

obtained truly excellent results. It is probable that future study and experience will indicate the precise method or technique to be used in particular cases or in a particular state of wound evolution, but at the present time the procedures are more or less empirical.

In the discussion SEVERETT stated that his allusion to a wide removal as in the case of tumors was merely figurative also that when using the term antiseptics he meant chemical bactericidal agents only. When he spoke of asepsis he had in view mechanical and physical means of healing the wound to the exclusion of chemical microbicides.

W. A. BRENNAN

Tuffier T. Treatment of War Injuries (*Traitement des plaies de guerre*) *Bull et mém. Soc. de chir. de Par* 1916 xlii 2452

Tuffier contends that sterilization of wounds is the most important part of their treatment. The suppression of infection is best effected by early sterilization. This can be done mechanically or chemically. The mechanical way is to extirpate the affected area totally or partially. Perhaps the best way of doing this is from without inward, i.e. where the trajectory is removed bodily with its content without being ripped open. It requires clever surgery and experience and a thorough knowledge of regional anatomy.

The practical results of excisions with suturing are unfortunately less brilliant than Tuffier had hoped. He thinks that in a general way it gives seven to eight unfavorable results in ten reunions. His experience at the front leads him to express the opinion that excision with suture should be attempted only by those with sufficient surgical

knowledge and with material and assistants sufficient to bring such treatment to a successful end, otherwise it is very difficult to avoid infection and its results. Moreover no patient treated by excision and suture should be evacuated from the ambulance until cicatrization is complete. Much trouble from infection occurs from disregarding this.

Tuffier insists on the necessity of immobilization as a complementary treatment to sterilization. Many wounded evacuated from the ambulances with normal temperature and in a perfect state arrive at their destination only to be classed as insufficiently treated, necessity for a new operation. The fact is that the movement and exposures inseparable from transportation have again activated the infective processes.

Although personally Tuffier has generally used ether he considers that Dakin's fluid applied according to the Carrel method is a powerful method of sterilization. In proof of which Tuffier states that he made a special examination of 170 wounded coming from various hospitals at the front to the Auxiliary Hospital Paris, who had not been treated according to Carrel's method. All were infected. On the other hand in wounded treated by the chemical method the bacteriologic curve fell in from three to fifteen days to one or two microbes per field. There is also the very important fact that this chemical sterilization is not confined to the tissues but even the bones are rendered perfectly sterile and complete fractures can be closed.

While wounds can be sterilized by mechanical methods alone, these are yet in the experimental stage. Chemical sterilization has proved itself efficient in the majority of cases, and of these the Carrel-Dakin method is the best. W. A. BRENNAN.

GYNECOLOGY

UTERUS

Smith, E. V. *Diagnosis and Caution Treatment of Carcinoma of the Cervix. 1st M J 96 xrxli, 087*

This report is based upon 100 cases of cancer of the cervix examined and treated in the Mayo Clinic between February 1, 1914, and July 1, 1916.

The large vaginal dilator has been discarded, so it was noticed that there frequently occurred a fine linear tear of the mucous membrane of the vagina upon dilatation. Later these cases returned with implants of carcinoma in the vaginal wall in places corresponding to these linear tears.

During the past year, in addition to the cauterization of these cases, ligation of the internal iliacs and one or both ovarian arteries has been done. This has been done not with the idea that the procedure was of great value *per se*, but in order to control the hemorrhages which occur in about 40 per cent of the cases if it is not done. In 30 cases which have been ligated, there has been no trouble with postoperative hemorrhage. Until the beginning of the ligation of the internal iliacs hemorrhage was a very frequent complication occurring usually about the twelfth or fourteenth day after the cauterization or at the time the slough was detached. Another postoperative complication encountered has been vesicovaginal fistula. Out of 100 operations there have been 10 vesicovaginal fistulae. Of these 10 cases only one case is still alive at the present time. They have healed spontaneously with the exception which was closed by operation.

The operative mortality has been 1 per cent; one patient having died in the hospital and that death was not attributed to the operation itself.

A total abdominal hysterectomy was made on 16 patients. The pathologists were unable to find carcinoma in 10 of the specimens removed but found it present in the remaining 6 cases. Of the 7 cases in which carcinoma was found at the second operation, it was known to be present in 5 cases at the time the hysterectomy was used. It cannot be inferred that merely because carcinoma could not be demonstrated in these 9 cases that they were not going to have a recurrence. One patient of these 10 has already had a recurrence and died.

The usual time selected for performing the hysterectomy has been at the end of 10 or 12 weeks after the cauterization. Thorough cauterization cannot be done without opening the abdomen.

There has been much discussion as to the degrees of heat that should be employed. There is a greater danger in using an iron that is too cold than in using one that is too hot. The average length of time of

cauterization in the 19 cases in which no carcinoma was found at hysterectomy was 40 minutes. The iron should be hot enough so that one can very plainly hear the tissue fry and frequently get the odor of the smoke or burning tissue. In those cases in which the author failed to kill the carcinoma, two specimens showed the carcinoma present just at the internal os of the cervix. In many of the earlier cases, the cauterization was not always carried to the fundus of the uterus.

Cancer is affected by the rays of radium and the effects of a thorough, careful cauterization and large doses of radium are very similar. Remarkable results follow both methods of treatment. The depth to which the carcinomatous tissue can be killed compares about equally, but it may be said that radium is the safer and less painful of the two methods. Both methods are dangerous in unskilled hands. Heat is the more practicable because it is cheaper and always can be obtained from any electrical light current or by the use of the common sold ring iron. EDWARD L. CORNELL.

Werner, P. *Ray Treatment of Uterine Cancer (Strahlenbehandlung des Gebärmutterkrebers)*. *Arch f G u K 96 vii, N*

In Wertheim's clinic in accordance with the views expressed by him in Halle in 1903 only inoperable cancer cases and recurrences and cases in which the patient refuses operation or in which there are contra-indications are subjected to ray treatment.

In 1914 von Cramm reported on 102 such cases. Werner now gives the later results in these cases up to 1916. Of these women 4 are still alive, 17 could not be traced, the others had died. Deducting those operated subsequent to the ray treatment, originally operable cases are today in good health.

From the result of this carefully observed large material Werner thinks that cancer tissue is very strikingly influenced by radium. But since the action of radium is principally exerted on the surface and since it does not appear to be reliable for the deeper tissues, the recoveries obtained with few exceptions, are not permanent. Furthermore the later irritative complications arising from prolonged radium treatment show that there is still great danger. For these reasons at the Wertheim Clinic the rule is to operate upon all operable uterine cancers.

For inoperable cases ray treatment gives invaluable results. It is followed by the disappearance of all symptoms for a long period. Improvement of the general condition as well as prolongation of life can be obtained more assuredly than with any other palliative treatment. W. A. BRIDGMAN.

Clark, J. G.: Results Obtained by the Use of Radium in the Treatment of Cancer of the Uterus. *Ann Surg Phila.*, 1916 lrv 602.

The author reviews briefly the development of the surgical treatment of cancer of the uterus and concludes that the surgical world is still very much in doubt as regards the most effective method of dealing with this disease. In carefully selected cases the best series of radical operations still yields less than 50 per cent of recoveries.

Clark does the radical operation in the clearly operable cases only and treats the others with radium. He has had only a limited experience with the Percy cautery method. During the past two years he has treated 44 cases of carcinoma of the uterus, vagina and urethra, using 85 to 100 mg of radium for twenty four hours.

The author gives his results in the radical operation for both cancer of the cervix and cancer of the fundus. A complete list of all cases treated by radium is given which includes patients alive as long as twenty two months after treatment.

S. A. CHALFANT

Warnekros, A.: The Value of Prophylactic Raying After Operation for Cancer of Uterus (Ueber den Wert der prophylaktischen Bestrahlungen nach Karzinomoperationen der Gebärmutter). *Monatsschr f Geburtsh u Gynaek* 1916 xlv No. 4

The question as to whether operable cases of cancer of the uterus should be operated upon or rayed is at present viewed in a different light at the different clinics. Much more uniformity of opinion exists as to whether the operated cases should be rayed or not. It has been believed that after the operation it is possible to destroy the few remaining cancer-cells by raying and so prevent recurrence. From the clinical observations at hand the value of prophylactic raying is proven. At the clinic in Berlin between 1911 and 1914 174 cases of cancer of the uterus were operated upon and discharged as cured primarily. Of 119 not rayed 66 have died of recurrences, 2 have been lost sight of and 51 are free from recurrences. Therefore 55 per cent of the cases have had recurrences. Of 55 cases regularly rayed only 11 have died of recurrence and 44 are still free. Only 18.5 per cent of these therefore have had recurrence as against 55.4 per cent of those who were not rayed. The recurrence figure of those rayed, therefore is only about one third of the former.

It would be a mistake in raying to give small or medium-sized doses as by doing so the rays might stimulate the few remaining cells to increased activity and rapid recurrence. If sufficiently large amounts of radium or mesothorium are available the treatment of course can consist of a combination of both the radium or mesothorium being brought directly in contact with the vaginal stump and even per rectum. Of the 55 prophylactically rayed women, 31 were given the combined treatment, the others the X rays alone. The rays were

given cutaneously and per vaginam, whereas the radium and mesothorium were used only per vaginam and per rectum.

The patients were treated for six months immediately after the operation and then every six weeks, later at longer intervals. The time or duration of the individual series depended somewhat upon the time the patient could spare. The principle, however was to give the greatest amount of raying within the shortest period of time.

The good results obtained so far prove the value of the prophylactic raying. The surgeon should urge each operated case to submit to prophylactic raying and so reduce recurrence to the minimum.

L. A. JOHNSON

Kreutzmann H. J.: Fibromyoma Uteri. *Calif St J Med* 1916 xiv 475

Kreutzmann describes the treatment of fibromyoma uteri from the time of Zweifel to Martin and concludes that the treatment of these tumors by surgery is a grave proceeding with serious mutilation and with marked postoperative effects especially when there is an oophorectomy done. Further he concludes:

1 Many fibromyoma uteri need no treatment whatsoever

2 The bulk of those needing treatment fall within the realm of roentgen ray therapy

3 The operations for fibromyoma uteri have reached the highest degree of simplicity, efficiency and safety

L. W. HENRY

Gerstenberg, E.: Severe Intraperitoneal Hemorrhage from Lateral Veins of the Uterus in a Case of Subserous Myoma of the Fundus (Schwere Intraperitoneale Blutung aus seitlichen Venen des Uterus bei subserosem Myom des Fundus). *Zentralbl f Gynaek* 1916 No 40.

The author reports the case of a nurse 39 years old who had previously had gastric catarrh and anemia. The menses had always been slight and occurred every five weeks, the last period five weeks previous. Prior to her present illness she had frequently had the sensation of having a full bladder with the desire to urinate. She had been caring for a heavy patient and was compelled to lift him alone quite frequently requiring a severe effort. The patient had a fainting spell lasting an hour accompanied with severe cold sweating. The following night another attack occurred. She took some brandy a warm bath went to bed and was found the next morning in collapse. The physician found the patient complaining of pain in the entire body especially in the shoulders. The chest findings were negative. In the abdomen between the umbilicus and symphysis a hard mass of peculiar contour was found. Vaginal examination showed a retroflexed and retrodisplaced small sized uterus and above it a freely movable hard tumor probably connected with the uterus and therefore probably a myoma. Its size was that of a newborn baby's

head its measurements 24 hours after the operation were 35x15x13 cm. The collapse was considered to be due to the loss of weight, anemia, and cardiac weakness due to the myoma and overwork. Recuperation and then operation was advised. The following morning the patient was again in collapse, and almost pulseless. An internal hemorrhage was diagnosed and dullness was ascertained in the flanks. A ruptured tubal pregnancy was suggested but energetically denied as possible by the attending physician. Perforation of an appendix or gastric ulcer were considered but not probable. The patient was immediately transported to the clinic and an attempt made to save her life.

The abdomen was opened almost without any narcosis and was found almost entirely filled with dark, venous, uncoagulated blood. The tubes and ovaries were inspected immediately and found normal. Nevertheless the greatest amount of blood was found in the small pelvis but this did not appear to be the source of the trouble the same was true of the myoma, which was inspected next. The bladder, bowel, and colon were normal, only the appendix showed evidences of a chronic inflammation. Only after careful cleansing of Douglas pouch and high elevation of the tumor was it possible to see on the right posterior edge of the uterus cracks in the uterine serosa, 1 cm long and 1 to 2 mm wide, running parallel with the long edge of the uterus. These cracks were not bleeding but careful examination revealed small veins running beneath the serosa. These cracks were held suspicious although no more blood came from them.

The myoma was first removed and then after again looking for other sources of bleeding and finding none a couple of catgut sutures were used to stop the hemorrhage. The patient recovered.

This case is interesting in that it presents a new source of intra-abdominal bleeding. The rupture was probably due to the prolonged strain to which the patient had been subjected, the premenstrual congestion of the pelvis, and the sudden compression of the veins during heavy lifting—the myoma probably impinging upon the distended veins.

From the history it would appear that the hemorrhage occurred the first night when a fainting spell accompanied the attack of weakness—the duration of the hemorrhage being, therefore, about 60 hours.

L. A. JUNKER.

Mendes de Leon M. A. Castration in Cases of Uterine Myoma (Kastration bei Uterusmyomen). *Nederl Tijdschr Geneesk.* 9, 6, Sept. 9.

In 800 myoma patients castration was done in 114 cases. The mortality was 2.6 per cent but if cases operated upon since 1905 alone are considered then the mortality drops to 1.58 per cent. In 6 cases the removal of the adnexa was incomplete in 4 cases in spite of complete removal hemorrhage continued and the myoma did not atrophy. In 96 of the patients, followed since operation, the result was satisfactory. The symptoms were very slight.

In myoma cases castration is quicker surer and more appropriate than roentgen therapy. The latter should only be considered when for a well-indicated reason operation is impossible.

A myoma which cannot be enucleated and which gives rise to very strong hemorrhages is best treated by castration which with a lesser degree of danger gives equally as good results as myotomy.

W. A. BRENNAN.

Bottaro, O. L. Unilateral Hemato-metra (Hematometra unilateral). *Rev. Assoc. med. argent.*, 9, 6, 570.

Bottaro describes a case in which one of the horns of a true bicornate uterus communicated with the cervical cavity by an imperforable orifice. The patient was 4 years old. Palpation disclosed an enlarged uterus anteflexed to the right. A tumor the size of a mandarin orange was felt in contact with the uterus on the lower left side. The tumor was smooth, painless, and fixed hysterometry 8 cm. The diagnosis was intraligamentary cyst. A median infra umbilical laparotomy showed that the uterus was lying to the right in the intraligamentary region. Its superior pole was incised and the supposed cyst extracted. It was soft, ovoid and with a prolongation downward to the vagina. The extractum was terminated by the bistoury and ligature. The mass contained a hematic, gummy thick odorless fluid.

The tumor was 5.5 cm long the circumference at its superior pole was about 5 cm. It had the appearance of a small uterus on its upper part there were vestiges of a round ligament and the left tube. A uterine artery ran parallel to its external border.

Histological examination showed that the sections were composed of uterine muscle with an atrophied mucosa.

W. A. BRENNAN.

Bell J. N. Rupture of the Uterus in Cesareanized Women: Review of the Literature. *Am. J. Obs. N.Y.* 9, 6, vol. 95.

The author finds that there are 78 cases of rupture of the uterus following a cesarean section recorded in the literature and he reports the seventy-ninth. From his study he offers the following conclusions.

1. A cesareanized woman is always in danger of rupture of the uterus in subsequent pregnancies and should therefore be under careful observation during the latter months of the period of gestation.

2. If the puerperium following the first cesarean section was afebrile the patient may be permitted to go to term with the next child provided she can spend the last month of gestation in the hospital if not labor should be anticipated at least two weeks prior to term.

3. Implantation of the placenta over the scar area undoubtedly increases the danger of rupture of the uterus in a subsequent pregnancy the same may be said of a febrile puerperium following hysterotomy.

C. H. DAVIS.

Williams J T: The Anatomy of Prolapse of the Uterus with a Consideration of the Mechanical Principles of Its Repair. *Interst. M J* 1916 xiii, 878

The author states that his reason for making a study of prolapse uteri was due to the fact that there existed a wide variety of procedures for the relief of the condition but that none of them seemed to be wholly successful. He further states that only by a full understanding of the anatomical conditions present in prolapse can failure be avoided. Every operation that has been devised for the cure of procidentia when correctly performed in properly selected cases will effect a cure, but the best of these operations done without a proper appreciation of its anatomical basis is certain to result in failure.

A tabulated list of the most popular operations for procidentia, with comments by the author are given.

The author's conclusions are as follows:

1 Prolapse of the uterus is the result of stretching of its strong fascial supports.

2 Procidentia is most common in women who have had a high forceps delivery or in multiparous women with frequent labors in whom the fascia has not involuted properly.

3 The mechanism of prolapse is as follows. As the fascial layer gives way the anterior wall of the vagina prolapses, and the cervix simultaneously drops downward and forward. The uterus becomes secondarily retroverted. Finally the whole anterior vaginal wall followed by the cervix and lastly the upper part of the vaginal wall appears outside the vulva.

4 The anatomical principle of successful repair by any operation is that it must restore the pelvic fascia to its normal tension. It is usually impossible to restore the integrity of the fascia, but so long as it can be held under sufficient tension to support the bladder the operation will be functionally successful.

5 All operations for prolapse should be completed by restoration of the pelvic floor since this usually needs repair also not with the idea that perineorraphy will support a prolapsed uterus.

HARVEY B MATTHEWS.

ADNEXAL AND PERIUTERINE CONDITIONS

Gelat, S H: Tubercular Adnexitis. *Interst. M J* 1916 xviii, 1043

After discussing the various forms of pelvic tuberculosis in the female the author briefly reports 28 cases.

An analysis of the 28 cases presents many interesting facts. With the exception of 2 cases all the patients ranged in age from 20 to 35 years. One was 36 and the other 45. The latter case did not present a very advanced type of lesion in fact it was an accidental find in the course of a laparotomy for fibroids.

Menstruation was normal in 46 per cent of the

cases scanty in 32 per cent and profuse in 22 per cent. In several of the cases there were complaints of slight irregularities in time. All but 2 of the patients were married and in 85 per cent of the cases one of the main complaints was sterility though many were married more than five years. The symptoms offered nothing unusual pain being the most constant symptom. One case returned to the hospital after a postvaginal section because of the persistence of the symptoms and a discharging sinus and two patients complained solely of sterility.

The lesions found varied widely but in the large majority of cases it was either a tubo-ovarian abscess or a tubercular salpingo-oophoritis. In the treatment conservatism was aimed at in some instances there were brilliant results while in others it would seem that a more radical procedure would have given a better result. Of the 28 cases 12 were discharged improved by which was meant a general improvement but with some pelvic exudate present in 10 of these cases there was an incomplete operation either a partial resection of tube or ovary on one or both sides or a unilateral salpingo-oophorectomy. In one case with peritoneal tuberculosis and an advanced genital lesion involving both tubes and ovaries, the uterus was left and in one other a complicating pulmonary lesion probably interfered with the proper healing. In one case eight years after bilateral salpingectomy for tubal tuberculosis, the abdomen was reopened and while no evidence of tuberculosis was found an extensive adhesive pelvic peritonitis was present. The operative results were not particularly encouraging. Of the 28 cases, 13 were discharged well but were not subsequently traced 12 were discharged improved and though undoubtedly the pelvic condition was helped in all probability the residual exudate would give rise to further trouble. In three instances operation was followed by exitus.

Of the 3 cases that died 2 cases had pulmonary tuberculosis. One of these 2 cases also gave the history of a tubercular arthritis while the third case had an extensive pelvic lesion.

The complications, while not numerous were varied. In 4 cases there were fecal fistulae all in rather advanced cases. There was one case of urinary fistula, also in an advanced case. Two of the intestinal fistulae healed spontaneously and the urinary fistula also. In two of the other cases the fistulae persisted up to the time of exitus.

In 5 cases the abdominal wound broke down and in 3 the patients were discharged with persistent sinuses. One of the cases died of peritonitis and another death followed exhaustion and tubercular enteritis the wound never healing. One case of peritonitis developed which led to a fatal termination.

One interesting fact was the duration of the hospital stay. None of the cases was in the hospital less than three weeks. The average duration was about six weeks. Several of them were in the hospital from eight to ten weeks 2 finally discharged

Improved, were in four and a half and six months, respectively. In 2 of the fatal cases one was bed ridden in the hospital for five and a half months, the other for nine and a half months. It was in those cases of bilateral tubo-ovarian disease with conservation of the uterus and the subsequent development of pelvic exudates that the stay was most prolonged. Many of the cases were discharged as improved with persistent exudates and sent to the country for rest and recuperation. EDWARD L. CORNELL.

Baccus C. B.: Practical Results from Our Present Views Regarding the Endocrinal Action of the Ovary (Praktische Ergebnisse in unserem heutigen Anschauungen ueber die endokrine Tätigkeit des Eierstockes). *Zeitschrift für Psychiatrie und Neurologie* 6: 333vi.

Primarily the author shows that the frequent failures in our organic therapy are due not so much to wrong indications as to the uncertainty in the action of the preparations used. All manufacturers of these preparations keep their methods of manufacture secret and we are entirely dependent upon them. Control of their manufacture is entirely lacking. He calls attention to the fact that it is important to know from what animals, at what age and stage of gestation these preparations are made.

The origin of the ovarian hormone is still in doubt the interstitial gland, the corpus luteum and follicle apparatus all being thought the seat of it. According to the author, view the theca cells (Steinach's gland of puberty) can be excluded. The corpus luteum cannot be the origin alone as the hormone action is manifest in the child and in the newborn before the corpus luteum is developed.

The corpus luteum theory should be retained although the follicle is the actual gland in the ovary having an internal secretion. The corpus luteum is the only internal secreting part of the follicle remaining after expulsion of the egg and hypertrophies and perhaps performs the function potentially. Therefore the corpus luteum is not at all a specific action but only a quantitatively increased follicle action. So long as the follicle in the child's ovary produces the hormone it is a constant quantity but a minute one favoring only the gradual development of the sexual characteristic of the fetus and child. The stronger development of the follicle at the time of puberty requires stronger hormone development and with it more rapid development of the genitalia and sexual characteristics. At the moment, however, when the follicle extrudes the egg the remaining portion proliferates and produces a much larger amount of hormone and the action is consequently much more apparent, rapid development of sexual characteristics, puberty, menstruation, increased sexual desire.

The important part, however, in puberty and in the sexually ripe age is the increased hormone production and not the corpus luteum. It is probable that a storage of ovarian hormone occurs in the theca cells and in the placenta and decidua.

From these views it is seen that the hormone production during the entire sexual period of woman is fairly constant as in the ovary there is almost always a maturing follicle or a maturing corpus luteum. Only in three periods can a decrease be supposed to exist: in the puerperium, the period of lactation, and in the latter half of pregnancy.

The indications for administration of ovarian extract are clear in the natural and more so in the artificial climacterium. One must administer an active preparation in dosage enough for effect that is until the symptoms disappear. The author speaks of having had good results combating high blood pressure occurring so commonly in the climacterium. He believes arteriosclerosis may be prevented in this manner. All cases referable to hypofunction of the ovary are indications for the administration of the extract especially amenorrhea, and so-called lactation atrophy. In chlorosis a good result is hardly to be expected but less so in adipositas dystrophica genitalis. In dysmenorrhea it is indicated if all other measures fail likewise in hyperemesis. The similarity of kraurosis to castration atrophy of the terminal genitalia suggests an active therapy also pruritus vulvae. In psychoses especially dementia praecox ovarian disturbances have been shown, but as these are probably a dys- or hypofunction success can hardly be anticipated. Symptoms depending on periodical menstrual disturbances and secretory disturbances such as mental depressions, hyperreflexia, unfounded jealousy, etc., may be induced artificially. Postpuerperal depressive mental states associated with amenorrhea or oligomenorrhea are influenced for the better. Many dermatoses bearing a periodical relationship to the genital function have promptly disappeared after the administration of ovarian tablets. Regarding contra-indications nothing has ever been written. Use of the extract is probably contra-indicated in tuberculosis. Just as a pregnancy influences a tuberculous process very unfavorably so does each menstruation to a lesser degree. This suggests the thought that effective ovarian therapy may produce a hyperemia of the tuberculous lesion with other destructive processes. L. A. JUNKER.

Hertz, H. J.: Primary Chorion-Epithelioma of Fallopian Tube Following Ruptured Ectopic Gestation. *Surg. Gynec. & Obst.* 9: 378ii, 60.

After briefly reviewing the literature the following case is reported:

The patient, 34 years of age, white, married, began to menstruate at 13 years, was regular and normal. She had been married for 10 years, had had 6 normal pregnancies and 4 abortions. The last pregnancy terminated in abortion four months prior to the onset of symptoms. For two weeks the patient complained of vaginal bleeding, accompanied by severe cramp-like pains in the lower abdomen. A diagnosis of ectopic gestation was made and operation advised. The operation was performed in December 1913. The abdomen was opened. The

right tube showed a pregnancy with rupture. The uterus was enlarged and soft and was about the size of a six weeks' pregnancy. The tube and ovary were removed and the abdomen closed. The pathological report of the specimen was as follows:

The mass consisted of tube and ovary and gestation sac in a collapsed condition. The tube measured 5 centimeters in length and 4 centimeters in diameter at its widest portion which was near the fimbriated end. The lumen was filled with clotted blood and the walls of the tube were considerably thickened. Between the lower border of the tube and ovary there was an irregularly shaped sac in a collapsed condition measuring 5 centimeters in diameter and lined with a shaggy dark red membrane. Adherent to these shaggy villous-like projections were masses of clotted blood. Under the microscope sections of the tubal wall showed an attached placenta. At points the chorionic epithelium extended into the thin wall of the tube for some distance and there were masses of these cells in the lumina of some of the veins. This involvement of the wall of the tube was more extensive than usual and justified the term chorio-epithelioma.

The diagnosis was primary chorio-epithelioma of the tube following ruptured tubal gestation.

Two years after operation the patient was in the best of health. Her menses were normal lasting three or four days. Her work is arduous, but she says she never felt better. EDWARD L. CORNELL.

Fraser J. R.: Pyosalpinx Complicating Ectopic Gestation. *Canad. M. Ass. J.* 1916 4, 10

The patient a woman aged 28 was admitted to the hospital September 5, 1915 complaining of pain and tenderness in the hypogastrium and slight bloody discharge. Her last period had been May 15, 1915. She had been well up to August 29 when she was suddenly seized with severe colicky pain in the lower abdomen and brisk vaginal hemorrhage. With rest in bed the pain subsided in a few days and she was up about her housework on September 4th when she again began to have severe colicky low abdominal pains increasing in intensity, especially on the right side also vomiting and fever. Her temperature was 102, pulse 132, respiration 36 with symptoms of an acute infection. The abdomen was moderately distended the uterus small in the midline above the pubis the right appendage was more or less diffuse and easily the size of a grapefruit the left was the size of a small orange. Operation revealed a large right tubo-ovarian abscess and a left ruptured tubal pregnancy.

C. D. HOLMES.

EXTERNAL GENITALIA

Du Bose F. G.: An Abdominal Operation for the Cure of Cystocele. *S. & Gynec. & Obst.* 1916 xdl, 727

Among the advantages of the intra-abdominal operation is that it is applicable alike to the child

bearing and the postclimacteric periods. It does not depend on hysterotomy or hysteropexy for success, nor for the resection of the tubes to produce sterility. It contemplates the restoration of the pelvic aponeurotic diaphragm, elevation of the bladder at a higher level on the uterus and suspension of the bladder and uterus through their ligamentary supports retaining a degree of motility commensurate with the functions of the reproductive organs and leaving the reconstructed pelvic visceral positions as nearly anatomically correct as possible. Like other operations done to remedy this sliding hernia of the bladder it requires the repair of the torn perineum and no penneorrhaphy is recognized except that which approximates the divided levator ani muscles. It is apparent that this operation may be performed in addition to other pelvic or abdominal surgery which may be required with but little additional time since it is not tedious in its technique.

After incising transversely the vesico-uterine peritoneal fold between the round ligaments, complete separation of the bladder from the uterus by blunt dissection and from the upper inch or more of the anterior vaginal wall is done so that the bladder being thoroughly mobilized may be lifted well up and forward from these attachments. The round ligaments on each side are caught united and attached to the most dependent part of the vesicovaginal denudation with a linen suture passed well into the anterior vaginal wall. Another suture or series of sutures of linen approximates the frayed or torn ends of the vesico-uterine ligaments and attaches them to the anterior and upper cervical portions of the uterus. By letting the needle bite far out laterally to include the ends of the vesico-uterine ligaments, a narrowing of the anterior vaginal wall in its long axis occurs. The slack is also taken up in the relaxed pelvic aponeurotic diaphragm. Added to this restoration is the support of the round ligament folds. If these ligaments are attenuated and there is still a doubt that the relaxation and decensus will not be overcome by these supports, then artery forceps may be forced through the broad ligaments about on a line with the internal os laterally so that the forceps will catch in the bite the loose folds of the sacro-uterine ligaments and pull them through. The ends of these ligaments are then sutured together with linen and these ends in turn sutured to the denudation on the upper cervical portion of the uterus, serving to pull upward and backward the cervix uteri and to take up the slack in the relaxed sacro-uterine folds. Successive tiers of chromic catgut sutures are placed so as to approximate the bladder on the uterus at a much higher level than its former normal attachment. Before this suture line is completed it will be found easier to plicate with linen the round ligaments on each side including in the suture the wall of the uterus laterally and the incised edge of the broad ligament peritoneum. This (running) fine linen or silk suture continues until the plicated round ligament approxi-

makes its original attachment into the uterus, restoring its original point of traction on the fundus uteri. One or more catgut sutures are placed between the uterus and bladder until the former reflection of the bladder is raised to the fundus and attached by a running suture (of catgut in the fertile linen in the sterile) along a line running above the uterine insertion of the round ligaments. The operation is completed by a continuous suture turning in and approximating the peritoneal edges of the bladder laterally to the broad ligaments and to the fundus of the uterus above.

EDWARD L. CORRELL.

Wall, G. A. Incontinence in the Female; Its Prognosis and Treatment. *South. M. J.* 9 6 ix, 662.

The author states that incontinence in the female in the vast majority of cases is due either to a destruction of the urethra or to its extreme dilatation. Childbirth poorly managed accounts for the majority of these cases. As a matter of fact he continues the great amount of surgery today is largely due to the practice of bad obstetrics.

In the treatment of this condition the cause must be determined. First, is it due to destruction of the urethra combined with injury to the vesical sphincter or second is it due to a dilatation of the urethra without any destruction of tissue? No cure in any case, can be effected unless the action of the sphincter is restored.

Of the many operations devised for the cure of this condition none have proved entirely satisfactory because they have not restored the integrity of the sphincter.

The author's method is given in detail and essentially consists in reconstructing a new urethra from the perirethral tissues by denuding and sewing these tissues over a rubber catheter. In addition, the author puts a purse-string suture of linen around the neck of the bladder and ties this suture tightly about the soft rubber catheter. This suture, he believes is the secret of success in curing incontinence in the female.

The vaginal mucosa is then sutured over the newly constructed urethra, care being taken to obliterate all dead spaces. The catheter is removed in five days. HARVEY B. M. TRENKLE.

MISCELLANEOUS

Reder, F. Drainage for Pus Conditions in the Pelvis During Pregnancy. *Am. J. Obst. N. Y.* 9 6 lxiv, 935.

The author believes that when pus accumulates in the pelvis during pregnancy it should be drained into the rectum. Rectal section for drainage of a pelvic abscess is in itself a minor procedure. It is the feeling of uncertainty of finding the pus, or of injuring a viscus, that causes one to hesitate. Especially is this true when the pus accumulation

is small and when no distinct fluctuation can be elicited.

There still exists a great reluctance to attack a pelvic abscess through the rectum presumably because of the likelihood of infecting the abscess cavity with fecal material. This however may be considered as doubtful, inasmuch as this avenue is one of Nature's outlets to relieve the organism of pus accumulated in the pelvis. Patients relieved in this manner have usually suffered no untoward results, and their recoveries have been satisfactory.

In making the rectal incision the anus is first gently dilated and the rectum is then well douched. The index finger without glove searches for the fluctuating point in the tense mass when found, a sharp pointed bistoury is passed along the volar surface of the finger and cautiously introduced into the spot selected. As soon as pus is encountered, the bistoury is withdrawn and the point of a dressing forceps introduced into the opening. By spreading the branches of the forceps, a hole sufficiently large to admit the end of the index finger is made. A large winged rubber tube is then passed into the abscess cavity far enough for one end of it to protrude from the anus. At the end of a week the tube is removed. C. H. DAVIS.

Hall J. N. Diagnosis of Menstrual Reflex Through the Tubes. *Calo Med.* 9 6 xiii, 373.

The diagnosis is practically that of a ruptured tubal pregnancy but in a girl at or soon after the age at which menstruation should occur and has failed to appear. The entire picture is toned down, however, and there may be an accompanying low grade septic peritonitis. There is an absence of a history of irregular dribbling menstrual flow.

The author reports the case of a girl of fifteen years who was admitted to the hospital moribund. She had never menstruated. She was in collapse with a slightly distended abdomen containing a small amount of fluid, she had cramping pain and vomiting. Her temperature was 100° pulse rapid and feeble, was pallid. Collapse was followed by death in forty-eight hours. Postmortem showed the belly half filled with tarry blood and the leaking tip of the tube was easily identified. The hymen was perforated but the vagina was obstructed high up by a probable developmental closure. In this case the infectious element predominated over the hemorrhagic symptoms.

Another case was that of a girl, fourteen years of age well developed but had never menstruated. She had complained for thirty-six hours of violent cramping pain in the lower abdomen. Her temperature was 100° pulse 120 vomiting and more collapse than is found in appendicitis except after operation. At operation the lower abdomen was found to be full of tarry blood from a leaking tip of the left tube. About one inch above the hymen an adhesive closure was found in the vagina very similar to the adhesions of an adherent prepuce to glans. Recovery was uneventful. C. D. HOLMES.

Bumm E. and Schaefer P: Ray Treatment of Genital Carcinoma (Strahlenbehandlung der genital Karzinome) *Arch f Gynack.* 1916 xvi No 1

The authors report on 401 cases treated by mesothorium and radium with medium roentgen doses in a number of cases in order to obtain better deep effects. These 401 cases comprise

| | |
|-----------------------------|----------|
| Carcinoma coli | 45 cases |
| Carcinoma corporis | 5 cases |
| Carcinoma vaginæ | 5 cases |
| Carcinoma vulvæ | 13 cases |
| Carcinoma urethræ | 5 cases |
| Recurrences after operation | 74 cases |
| | 40 cases |

Of the total 401 cases, 36 recovered, 9.0 per cent.
Of the 45 cervical cases 5 recovered 11.1 per cent.
Of the 5 corpus cases 3 recovered
Of the 5 vagina cases 3 recovered
Of the 3 vulva cases 6 recovered
Of the 5 urethral cases 3 recovered
Of the 74 recurrent cases 3 recovered

Of the 282 cervical cases 155 were operable or borderline cases and of these 83 53.5 per cent recovered.

The authors take up in detail the local effects of radio-active substance the action on the deep tissues recurrences technique and finally they draw a comparison of the results obtained in ray treatment with the results of operative treatment. In the years 1911-1915 203 women were operated upon and with these are compared the 155 who were rayed but whose cases were operable.

Of the 203 operated cases 98 have recovered — 48.27 per cent of the 155 rayed 83 have recovered — 53.54 per cent. In all cases the time lapsing since treatment is not less than two years.

As regards the value of the comparison every thing will depend upon whether there is an increase of parametric or glandular recurrence in the rayed patients within the next few years.

According to experience in the Berlin clinic up to date the results of ray treatment of cervical carcinoma are equal to the results in operated cases and therefore the ray treatment of all such cases will be continued, since, owing to the elimination of burns and necrosis due to better technique, the results have greatly improved. W. A. BRIDGMAN

Culbertson C.: A Study of the Menopause with Special Reference to Its Vasomotor Disturbances *Surg Gynec & Obst* 1916 xliii, 667

This article is the report of a study of the menopause extending over a period of two years. Twenty nine cases are described by way of illustration seventeen of which are accompanied by blood pressure charts. The work develops the theory that the menopause represents a functional derangement on the part of various glands of the endocrine system subsequent to the cessation of the ovarian secretion. A brief discussion of the somatic and psychic phenomena of the climacterium is presented with a review of recent literature pertaining thereto. Likewise a short résumé of recent work

covering the physiology of the various glands forming the ductless chain is necessarily presented. The cases reported cover the menopause situation both in the fourth decade and in earlier years that is, both normal and premature climacteria. The author attempts to explain the milder phenomena characterizing the premature menopause on the theory of duration of association that is that the longer the endocrine glands are associated in function with the gonad the more marked will be the disarrangement when that gonad is withdrawn. Hence the shorter the time during which the various glands have had to work together the milder the disturbance when that derangement is brought about.

The best means at hand today of estimating this disturbance is by a study of the blood pressure, wherein is found an excellent expression of menopause reaction or instability. The results of the author's observations are as follows:

1. The menopause is a functional derangement on the part of various glands of the endocrine system subsequent to the cessation of the ovarian secretion.

2. On this basis may be explained the psychic and somatic manifestations of the menopause.

3. The vasomotor disturbances represent an instability of arterial tension.

4. In the majority of cases this takes the form of a vacillating hypertension both systolic and diastolic.

5. The diastolic pressure is not elevated proportionately to the systolic. This produces an increased pulse-pressure.

6. Hot flushes sweating and other vasomotor symptoms are directly created by the vacillations in arterial tension.

7. In a minority of cases there is arterial hypotension and here also the systolic and diastolic pressures are out of proportion.

8. Hypertension is apparently due to a relative oversufficiency on the part of the hypophysis or the adrenals.

9. The psychic symptoms are apparently influenced by thyroid dysfunction in the majority of cases a hyperthyroidism in the minority a hypothyroidism.

10. The administration of the missing hormone, represented by the extract of corpora lutea from animals in early gestation brings about a gradual restoration to normal of the blood pressure with disappearance of the mental symptoms.

11. This reduction of blood pressure by organotherapy together with the disproportionate systolic and diastolic rise is offered as evidence that the hypertension is a functional one and not due to organic changes.

12. Blood pressure estimation is essential as a means both of measuring the degree of menopause disturbance and of controlling its therapy.

13. An occasional pressure reading is of little or no value. Tension must be determined at frequent intervals, preferably daily until improvement is well under way.

10 The significance of functional hypertension as a factor in uterine hemorrhage is obvious and will be made the subject of a subsequent report.

Melgar M. A Case of Prolapse of the Urinary Bladder (Un caso de prolapsio de la vejiga de la orina). *Rev. Ibero-Am. de cien. med.* Madrid 9 6, xxvii 305

Melgar reports an extremely rare case of total inversion of the bladder with complete prolapse through the vulva. The patient was a woman of 46 a primipara, who two years previous had had a labor which lasted eight days and was completed by the forceps, the complications arising from which brought her to the hospital in a pitiful condition from the effects of a urinary fistula.

On examination there was seen outside the vulva a smooth, red, humid tumor dribbling clear liquid. This could be reduced through an enormous fistula which extended from the bottom of the exterior vaginal sac to 3.5 cm. beyond the meatus, and laterally from one to the other ischium. The vagina was extensively sclerosed, the pelvis was clearly of the rachitic type and this malformation caused the labor trouble.

Three weeks later after treatment of the eroded skin in the neighborhood of the fistula operative intervention was carried out in two stages: (1) opening up of the vagina by means of longitudinal incisions and exploration of the ureters; (2) resection of the fibrous vaginal obstructions, removal of the vesicovaginal partition, urethra of the bladder the neck being directed into the vulva.

The patient recovered with the exception of small fistula which, however does not allow the bladder to prolapse. W. A. BROWN

Siegel Further Observations on the Conceptive Capacity of Woman and on the Determination of Sex (Weitere Beobachtungen zur Konzeptionsfähigkeit der Frau und Geschlechtsbestimmung des Kindes). *Deutsche med. Wochenschr.* 9 6 xlii, 79

Following his observations published in July last concerning the conceptive capacity of woman Siegel has made further studies based on the observations made in the cases of 20 soldiers returning home on short furloughs. The curve constructed by Siegel shows a rise in the conceptive capacity of woman immediately after menstruation which reaches a maximum of 52 per cent the sixth day after. The curve remains about the same height till the thirteenth day and then drops till the twenty-second day after which there is almost absolute sterility. Only cases of regular 28 day menstruation have been considered. Sterility after the twenty-second day following menstruation is probably due to mechanical difficulty of ovum migration.

The observations made by Siegel also give special information concerning sex determination. Co-habitation from the first to ninth day after menstrua-

tion commences gave 86 per cent of males. Co-habitation from the fifteenth to the twenty-second day gave 86 per cent females. W. A. BROWN

Neuf F. E. Concurring Tumors in Women. *Am. J. Surg.* 9 6 xxi, 344.

The author gives the complete clinical analysis of a pararenal new growth which happened to occur in a tumor family and points out a way of approaching the clinical study of tumors in women with reference to the factors which determine their malignancy by utilizing for this purpose instances of concurring new-growths in families or individuals.

He indicates that in such cases, the other in themselves more commonplace tumors, can also be utilized in some phases of the study as controls. This is done in order to eliminate the effect of individual or family idiosyncrasy in the behavior of neoplasms as for example when the rate of tumor growth in a particular individual is considered in its bearing upon the question of malignancy.

Thus in general, in any case of concurring tumors, the more typical or familiar growth which would otherwise be of little interest, may serve as the control tumor or standardizing growth for the more unusual or atypical forms. For this reason concurring tumors growing under the same or similar conditions and from the same parent medium, as it were are particularly suitable for comparative study.

The pararenal growth which is described, reached the size of an adult's head in the course of twenty-one months. It was removed retroperitoneally and stripped away from the kidney with such ease, that it appeared to be of a benign, non-invasive type and it did not seem justifiable to sacrifice the kidney.

This decision appeared to be correct beyond much doubt when numerous sections from various parts of the growth showed the tumor to be histologically a fibroma (Wood, Rohdenberg, Garnde, Diner). Nevertheless, a true pararenal fibroma of such size is known to be extremely rare.

The most searching tissue examination revealed nothing which from the present-day point of view could be considered definitely prognostic of malignancy.

Notwithstanding this, the tumor recurred and the recurring growth proved to be a sarcoma of the small spindle-cell type. It is, therefore, clear that in spite of the impression at operation and the microscopic findings, the growth in its parent tumor stage should already have been considered as potentially malignant not a fibroma at first and a sarcoma later but a growth which was hardly benign from the beginning merely unfolding its malignant qualities more clearly in the histological cell type, as it developed and matured. Humphreys, who reviewed the material of the growth and recurrence, following the classification of Bost characterized the tumor as a fibroma sarcomatousum.

At least from a practical point of view, the fact that the parent growth reached the size of an adult

head in the course of about twenty-one months should have been given a more compelling significance in deciding the question of its benignity. Practically speaking it is the rate of growth which marks the tumor as malignant. The rapidly proliferating cell invades and it causes metastasis when it gets into the blood and lymph paths. This rapidly reproducing cell need not be very atypical in order to be characterized as malignant indeed it may only become so with extremes of irritation, or where there is external interference with cell division mechanical or chemical.

A pararenal growth which is solid and not cystic, and enlarges at almost half the rate of the normal tumor of pregnancy must be dependent on a very rapid proliferation of the cells which constitute it and should be treated as potentially malignant at least from the clinician's viewpoint.

Schmitz, H.: Radium in Gynecology *Internat M J* 1916 xliii 1097

Radium therapy has not as yet been completely developed. It will require years and years of careful observation and close study by the clinician and physicist to perfect the therapy. The application of the radium is an art. It can be acquired only by the most painstaking observation and close application. In the hands of the uninitiated, radium is distinctly dangerous. The pioneers in roentgen ray work lost their lives or were crippled because its dangers were not known. Many a patient succumbed to roentgen ray cancer because the therapist did not have the perfect technique used at present. The same applies to the use of radium. The rays are wonderfully controllable if one only knows how to use them. They are terribly destructive if not held within bounds.

At present we may claim that the radium rays will cause 100 per cent cures, immediate and remote, in myomata uteri, hemorrhagic metropathies and chronic endometritides and cervicitides if the indications are scrupulously followed. In carcinoma uteri the use of radium is indicated as a prophylactic after radical extirpation when it

will increase the efficacy of the surgical procedure. It is indicated in operable carcinomata if constitutional contra indications to surgery exist. It is a specific as a palliative in inoperable cancers, when it will cause an apparent cure in 35 per cent of the cases and a subjective improvement in an additional 16 per cent.

EDWARD L. CORNELL.

Skeel, R. E.: A Plea for the Renaissance in Plastic Gynecology *Internat M J* 1916 xliii, 1066

One who comes into daily contact with gynecologic patients cannot avoid the conclusion that plastic surgery upon the cervix and perineum is rapidly becoming a lost art.

This seems in part to be due to the belief of the embryonic surgeon that almost anyone can repair a cervix or perform a perineorrhaphy, and also in part to the attitude of the accomplished operator that such minor procedures are unimportant and beneath his dignity and that they do not afford sufficient opportunity for a spectacular display of skill.

This is unfortunate because any operation which is worth doing at all is worth doing as well as it can be done and successful plastic work on the cervix and perineum not only requires dexterity, but also demands thoughtful consideration of both the anatomy and physiology of the structures involved.

To operate upon a relaxed gaping pelvic outlet in such a manner as to restore the normal function of the pelvic floor requires skill and knowledge of the highest order and the determination of when an operation upon the cervix is indicated and the particular operation to be performed in the individual case demands something more than reference to a simple rule of thumb.

The real menace of eroded unhealed lacerated cervixes in women who are nearing or past the climacteric has but recently been appreciated and the possibility that malignant degeneration may appear in this structure after it is traumatized while it is so rare as to be a source of much comment in women who have not suffered the injuries of child birth, has not been sufficiently emphasized.

EDWARD L. CORNELL.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Green G W and Moore, J J : Full Term Ectopic Gestation. *Ill nol M J* 9 6 xx 356

The authors give a brief review of the pathology of full term ectopic gestation with a report of their case which through mistake diagnosis had gone 46 weeks before operation. Spurious labor pains were present for two days in the 30th week, at which time fetal movements ceased and a bloody discharge began which lasted until the time of operation. The operation consisted of a long median abdominal incision which disclosed a large retroperitoneal tumor situated a little to the right side with a slightly softened flattened uterus in front and to the left of the tumor. The right ovary and tube could not be distinguished. Bonds of adhesions with blood vessels which ran from the omentum to the sac were ligated and secured. The peritoneal covering of the sac was opened for about 4 inches and the contents peeled out *en masse* without opening. After removing the sac, the posterior layers of peritoneum were trimmed and sutured. The left ovary was left in place but the tube was removed. The abdominal wound was closed in the usual way. No drainage was used and the patient made an uneventful recovery.

The tumor sac was 5 cm. in diameter and contained a fully developed female fetus, slightly macerated weighing 8 5 pounds. The placenta weighed the same, probably due to a large hemorrhage to it. Sections of the fetal sac contained compressed portions of the fallopian tube

Bawden, G P Eclampsia *West M Soc* 9 6 iii 78

The author defines eclampsia as the culmination of a toxemia, the origin of which is not constant. The toxemia is the result of some acute or chronic disturbance of the vital organs either secretory or excretory such as the liver kidney thyroid or pancreas.

The crises of eclampsia appear as convulsions, explosions of pain, cerebral or subcutaneous gastric irritation, hemorrhages, retinal cerebral, or placental or an acute degeneration of the liver or other organs.

Some of the signs of the toxemia are lassitude, increasing headache, gastric and visual disturbances, constipation, dry skin and parched mucous membranes, puffiness of the kin, especially of the face, hands and feet, an indefinite restlessness, especially in the evening leading to insomnia in the early part of the night, an early and gradual rise of blood pressure, decrease in the daily amount of urine

secreted even before changes in the composition of the urine take place, also the presence of albumin in the urine in most cases.

Bawden's treatment of the pre-eclamptic stages is as follows: (1) enforced rest (2) regulation of the diet—reducing the proteids and increasing the amount of fruit vegetables, and liquids water milk and buttermilk (3) increasing the elimination by the skin kidneys, and bowels, using bath, diuretics, laxatives and colon irrigations (4) if necessary the blood-pressure may be reduced by nitroglycerin and veratrum viride, or if eclampsia threatens venesection may be performed (5) if conditions do not improve after the above treatment the uterus should be emptied.

If eclampsia has actually set in the treatment will depend on the stage of the labor. The author believes that the uterus should be emptied as soon as possible. If labor has commenced and contractions are strong it may be left to Nature by controlling the convulsions by morphine chloral and other gentle purgatives. Intravenous or subcutaneous salines using hot packs and if necessary assisting the labor by manually dilating the cervix and using forceps. If the cervix is not taken up or is not readily dilated cesarean section should be performed. The child's chances for life are thus greatly increased. Chloroform should not be used if it can be avoided as it tends to increase the degeneration of the liver-cells. Ether or nitrous oxide with oxygen are better. C D Holmes.

Ruge C. Liver and Kidney Eclampsia (Ueber Leber und Niereneclampsie). *M natl kr f Geburtsh Gynack* 9 6 ii 4

The clinical picture of eclampsia is extremely variable. This is also true of its three cardinal symptoms—convulsions, coma, and disturbances of kidney function. Like the clinical picture the anatomical picture of eclampsia shows marked variations. From this marked variability the question arises whether the apparent irregularity is accidental and whether the poison at one time produces one kind of phenomena and at another time other phenomena, or whether the poison does not possess different modifications under different conditions and having a different action, some attacking the liver more, others the brain and kidney more transitional forms of course being common.

The author now asks the question, Can we differentiate a liver eclampsia from a kidney eclampsia? He reviews a large series of cases comparing the clinical data with the anatomical findings in each case. That pure liver cases exist is proved by the

fact that a large number of eclampsia cases are reported in the literature which had absolutely no kidney changes whatsoever and on section showed very severe liver changes. Severe liver changes usually run parallel with a severe symptomatic picture but that there are severe symptomatic cases with mild pathological changes in the liver is proved by the author's ten cases of this type. In these cases there existed also a disturbance of kidney function of moderate degree and also a moderate change of these organs anatomically. This perhaps may be designated as the kidney eclampsia cases. In a third group are placed all those cases which had only very slight or no anatomical changes of the liver and died of some other cause. There were 14 such cases of which 3 showed absolutely no liver changes. A kidney disturbance however was present in all of these cases, but usually receded shortly after the delivery.

In a later paper the author will endeavor to determine whether it is possible to differentiate the cases into the same classification from the clinical picture alone. L. A. JUNGKE.

Zangemeister W.: Eclampsia as a Result of Cranial Pressure. (Die Eklampsie due Hirndruckfolge). *Zeitschr. f. Geburtsh. u. Gynäc.* 1916 LXXIX, No. 1.

As early as 1913 the author pointed out the marked similarity between the cerebral symptoms of eclampsia and the symptoms following induced cerebral pressure in animals. Later trephining done therapeutically showed that in reality such pressure existed in eclampsia and that its cause was edema of the brain. This proof confirmed the presence of increased cerebral pressure and pointed etiologically to an anomaly seen quite commonly in the pregnant woman in other parts of the body and in an advanced degree is recognized as hydrops gravidarum and a frequent forerunner of eclampsia. The supposition has been accepted as fact that hydrops gravidarum can be the cause of eclampsia if the edema extends to the brain.

Further studies have shown that the eclamptic phenomena not only do not justify such belief but force the conclusion that the increased cerebral pressure must be considered as the causal factor of eclampsia. The cause of the increased pressure is an edema which is only a part of the generalized hydrops occurring in certain pregnant women.

The results of therapy especially the favorable influence of emptying the uterus venesection in sufficient quantity the use of narcotics etc. can easily be explained upon the theory of cerebral pressure. It is especially important that the early symptoms of increased cerebral pressure and especially of hydrops gravidarum be observed and an effective prophylaxis instituted. L. A. JUNGKE.

Kosmak, G. W.: The Conservative Treatment of Eclampsia. *Am. J. Surg.*, 1916 XXX, 355.

Kosmak considers that an eclamptic patient is in a condition of shock and that an attempt at

operative delivery adds to this shock. The mother's life is the first consideration as the infants are frequently so poisoned that they do not survive. He believes all cases of eclampsia tend to terminate in labor and delivery spontaneously.

The treatment is as follows: Morphine sulphate grain one-fourth, is given hypodermically at once and in an hour one-eighth grain repeated every hour if necessary for two doses. A strong soap-suds enema is given and if the patient becomes conscious between convulsions one-half to one ounce of magnesium sulphate dissolved in water is given by mouth. High colonic irrigation of a sugar solution one tea-spoonful to one pint of water heated to 110° F. is given with the patient on the left side and quiet induced by ether anesthesia if necessary. One half pint of sugar solution is left in the rectum. A hot wet pack for twenty minutes followed by a dry pack for one hour is repeated every four hours as is also the colonic irrigation. If the cervix is sufficiently dilated a Voorhes bag may be inserted. Gastric lavage is performed if possible. None of these measures are resorted to if they disturb the patient before the morphine has taken effect or if an anesthetic cannot be given. If there is marked cyanosis and blood pressure above 175/8 to 12 ounces of blood are drawn from the vein.

If the patient has not delivered herself within ten to twelve hours after the first series of morphine injections, further small injections of morphine may be employed if necessary or bromide and chloral given per rectum. Delivery may be hastened by rupturing the membranes or applying forceps depending on conditions present. The author believes cesarean section in primiparae is sometimes necessary. D. H. BOYD.

Rongy A. J.: Rupture of the Cesarean Scar. *Am. J. Obst. N. Y.* 1916 LXXIV, 954.

The author reports two cases of spontaneous rupture of the uterine scar during pregnancy and one of threatened rupture during labor. From his study of this subject he reaches these conclusions:

1. Spontaneous rupture of the cesarean scar occurs in about 3 per cent of the cases. In most instances rupture takes place during labor. It takes place not infrequently during the latter half of the pregnancy especially during the last six weeks.

2. We have no means by which we can judge the strength of the scar. Rupture will occur in cases which run an afebrile course and in which union of the wound has apparently occurred primarily.

3. One third of all patients who undergo subsequent cesarean section show evidence of inflammatory reaction in and about the uterine wound. The result in such cases is a weakened scar.

4. Proper suturing of the uterine wound and exact approximation of the edges will not always prevent subsequent rupture of the scar.

5. The mortality rate of repeated section is smaller than that of primary cesarean section, because these patients are more carefully watched.

6 A patient who has once had a cesarean section should not be allowed to go through a tedious or severe labor. If labor does not progress rapidly cesarean section should be performed.

7 When advising a patient to have a cesarean section the management of subsequent pregnancies should be taken into consideration and discussed with some member of the family.

8 As a general rule, it may be stated that fully 75 per cent of women who have had a cesarean section are delivered by repeated sections during their subsequent labors.

9. The obstetrician should always bear in mind that cesarean section creates a new problem for the woman, and therefore he should carefully weigh the indications before he decides upon the abdominal route. He should remember that the dictum "Once a cesarean always a cesarean," holds true in fully 75 per cent of cases.

Finally it is the other belief that the cesarean section is very frequently resorted to in cases which should be delivered by other methods. Abdominal section is a major obstetrical operation. Surgeons and gynecologists who have no obstetrical knowledge are not competent to make a proper diagnosis and should not perform it. Obstetrics in order to gain the respect of both the community and the medical profession should be practiced only by those who have a proper training. C H DAVIS.

Offermann, I. I. The Healing and End Results in the Scar of Transverse Fundus Incision. In the Fritsch Cesarean Section (Heilung und Spätfolgen der Narbe beim queren Funduschnitt beim Kaiserschnitt nach Fritsch). *Monatsschrift für Geburtshilfe Gynäk.* 9:6 2h N. 3

Offermann describes a Porro operation which he made a year and a half after a cesarean section with fundus incision according to the Fritsch method, and in which the scar of the old incision was found much shrunken and consisting mainly of connective tissue. It was very thin in one place being only about 1 mm. thick. The author has collected from the literature cases of rupture of the old scar 9 cases of adhesive formations and ileus due to the scar and 3 cases of suppuration in the scar after transverse fundus incisions. He arrives at the conclusion that a transverse fundus incision in no wise prevents later rupture and that it has no advantages over the median longitudinal incision furthermore that this method of operation and this position of the incision favors adhesences with their dangerous sequelae, and also suppuration with its serious complications.

Von Franqué adds a supplement to this article in which he reports a further case of rupture of the scar of an old fundus incision which was discovered three years later at a subsequent cesarean section. He also comes to the conclusion that the transverse fundus incision has not fulfilled the expectations which Fritsch and others promised for it and that therefore he has abandoned it. W. A. BROWN.

Soler and Jullia: Treatment of Retentions in Abortions (Cobre tratamiento de las retenciones en los abortos). *Rev. de med. y ciruj. pract.*, Madrid. 9:6 21, 222.

The author discusses the views of those who favor intervention and those who insist on abstention in the treatment of uterine retentions after abortion.

The bacteriologic investigations of Winter were made on the lochia alone without taking into account the prior existence of bacteria in the blood, a circumstance which modifies his deductions, and which places only a secondary value upon them, as a support of abstention.

Emptying of the uterus, done opportunely with a good technique and good postoperative care has saved many lives. In cases in which the retention occasions only a slight hemorrhage and a delay in subinvolution, the administration of ergot and slight tamponade suffices. When hemorrhage is abundant and persists curetting should be done with the fingers or with the curette, and intra uterine treatment with essence of turpentine instituted. When the hemorrhage is infective (fœtid lochia), augmentation of pulse and temperature) emptying of the uterus should be followed by irrigation with turpentine serum at low pressure. Permanent drainage with a double rubber tube gives good service particularly in cases where there is some uterine deviation. Curetting suppresses the retentions which if retained may infect, or which are already infective. Curetting can prevent a bac tæmia, but it cannot cure it. W. A. BROWN.

Esch, P. The Pernicious (Hæmolytic) Anæmia of Pregnancy with More or Less Typical Pernicious Blood Picture (Ueber die perniciousartige (hæmolytische) Gravidæmæmia mit typischen oder einiger typischen perniciousen Blutbefund). *Zeitschrift für Geburtshilfe Gynäk.* 19:6 1vdt, N. 2.

At the Marburg Clinic there were observed during the past three years 6 cases of severe anæmia during pregnancy and the puerperium of which 3 died and 3 recovered. In 4 of the recovered cases we can speak of permanent cure but in the third case only a year has elapsed since the patient has been discharged. In regard to the general picture and the anatomical findings, the cases which died resembled very closely the clinical picture of the progressive pernicious anæmia of Biermer. In addition 3 cases had the classical blood picture of Ehrlich with a high color index, whereas the other 4 showed deviations from this but these deviations were not greater than those observed in classical pernicious anæmia. Points of difference between the anæmia of pregnancy and the classical pernicious anæmia of Biermer however are seen in the etiology and in the course of the disease. Contrary to pernicious anæmia there is undoubtedly an etiological relationship between pregnancy and the anæmia and probably a predisposing factor exists and the pregnancy is merely an exciting cause. The bone marrow changes and the appearance of nucleated

red cells in the blood must be considered as compensating phenomena, whereas the increased destruction of blood-cells causing clinically the subicteric discoloration of the skin and the urobilin excretion and anatomically the hemosiderosis must be looked upon as primary.

All patients were admitted into the clinic with a fully developed clinical picture. Observation regarding the early symptoms of the disease are entirely lacking in the literature as the patients in spite of marked changes in the blood are able to work and therefore come to the clinic late.

Therapeutically we have no successful remedy for this anemia of pregnancy probably because the disease is seen so late in pregnancy. In future an effort should be made to recognize the disease earlier and inaugurate energetic measures immediately. If in spite of energetic treatment the disease progresses the pregnancy should be interrupted.

L. A. JUNGER

Hirst J. C. The Control of the Nausea and Vomiting of Pregnancy by Intramuscular Injections of Corpus Luteum Extract. *J. Am. M. Ass.* 1916 LVII 1848

A preliminary report on this subject has already appeared. This article is the result of further experience.

Corpus luteum extract has now been used in 25 consecutive cases taken without any attempt to choose the favorable or eliminate the unfavorable. It was successful in controlling the nausea and vomiting in 21 of the 25. In 4 it proved a complete failure and did not in any way check the vomiting.

Of the successful cases 2 were of the pernicious type in which the vomiting was so severe that the termination of pregnancy was seriously considered. In one of these, 14 doses were given (2 daily 1 ccm each) and in the other 17 (also twice daily).

Another curious fact is the sedative action in markedly neurasthenic cases. Not only was the nausea improved but also the patients' nervous phenomena. The dizziness, headache, and other nervous manifestations of early pregnancy seemed to be remarkably controlled.

In the average case of nausea in which it amounts only to discomfort and the vomiting is limited to one or two morning attacks, the patient will usually respond to a dose of 1 ccm. every other day for five or six doses. In the more severe cases when nausea is constant and the patients are subject to frequent paroxysms of vomiting at any time during the day the dose should be 1 ccm. daily for from twelve to fifteen doses. During the period of treatment the patient's activity should be curtailed and as much rest as possible is essential.

In the pernicious cases the author has given 1 ccm. twice daily and would not hesitate to give more than this. These patients are confined to bed of course.

All injections are given deep into the muscle and never subcutaneously.

EDWARD L. CORNELL

Do Lee, J. B. Diagnosis and Management of Pregnancy in the Presence of Acute Abdominal Conditions. *Surg. Gynec. & Obst.* 1916 XLIII, 660.

The author doubts if there is a surgeon or gynecologist of experience who has not opened the abdomen for appendicitis and found ruptured cecum, or conversely. An ectopic pregnancy can give all the symptoms and signs of appendicitis—pain, vomiting, tympany, fever, leucocytosis, abdominal rigidity, etc. A rising leucocyte count however taken every two hours has a great deal of significance especially if there is, at the same time, an undiminished hemoglobin index.

Most difficult and often impossible is the diagnosis when extra uterine pregnancy and appendicitis coexist, or when extra uterine pregnancy and tubercular salpingitis coexist.

More important is the treatment of pregnancy in the presence of acute abdominal conditions. It is best to open the abdomen in practically all cases of cecum and remove the products of conception. In rare instances where a hematoma is very old and absolutely quiescent one may await its spontaneous absorption.

Without question the best treatment of acute appendicitis is immediate operation and if possible removal of the organ. The incision must be made higher and further in the flank, the more advanced in pregnancy the woman is found to be. Every effort should be made to reduce the amount of handling of the uterus and if drains are inserted, they should not impinge on the uterus if at all avoidable. Morphine in large doses should be given after operation in order to prevent abortion or premature labor. If uterine action supervenes, the labor must be conducted with a minimum of disturbance of the uterus. Newly formed peritoneal and per-uterine adhesions may not be broken which means that one should try to get Nature to empty the uterus without the necessity of manual or instrumental invasion of its cavity. In abortions the tampon should be used and if necessary the curette which by proper manipulation will move the uterus around less than manual cureage. Unfortunately it is often necessary to clean out the uterus because the organ, usually inflamed, cannot empty itself. In such cases spreading of the pus by breaking protective adhesions is almost inevitable and may be the direct cause of death. To avoid this accident Kroenig recommends the following for suppurative appendicitis: opening, draining and walling off the abscess, delivery from below by vaginal caesarean section, inspection of the abdominal contents and renewed walling off of any part disturbed by the vaginal delivery.

If abortion is impending at the time of operation, the uterus should be emptied first, then the abdomen opened. If the woman is at term caesarean section had best not be done (unless there are other indications for it) but the appendicitis should be treated and then large doses of opium given in the hope that labor will not supervene until the ad-

hesions are very firm and the pus nearly all drained out. If a cesarean section is done in the presence of a general peritonitis, the uterus had better be removed and the pelvis widely drained from below.

Acute inflammation of the fallopian tubes is rare during pregnancy. Contrary to the treatment on the side of pregnancy salpingectomy is recommended in these cases to prevent rupture during labor and infection during the puerperium.

Should labor come on during an attack of cholecystitis, delivery should be operatively consummated as soon as possible. It is important to prevent bearing-down efforts which might rupture the gall bladder. Chloroform should not be given if it destroys the liver already affected by inflammation.

Pregnancy may cause ileus, by stretching an adherent coil or knuckle of gut or tightening an old edhesion around it. In such cases emptying the uterus will relieve the obstruction. If ileus occurs before the child is viable the abdomen had better be opened and the intestines freed. After viability the uterus should be emptied from below and if this does not at once remove the trouble, laparotomy is indicated.

Peritonitis follows gynecileus in pregnancy and the puerperium is very fatal therefore, early treatment is imperative.

In the acute ureteropyelitis, it is very seldom necessary to empty the uterus to effect a cure. In renal abscess, drainage is indicated. Deaver has done cesarean section seven times for this indication and it deserves very respectful consideration.

Rupture of the uterus during pregnancy requires laparotomy. Perforation of the uterus made during an attempt at criminal abortion also requires immediate laparotomy. The uterus should be emptied through the perforation, enlarged if necessary. Whether or not the uterus should be removed depends on circumstances.

Strangulated hernia is very rare during pregnancy and labor but various ruptures are not uncommon. Unless the gut is adherent the growing uterus pushes the contents of the sac out and away from the hernial opening and makes a temporary cure but the ring is enlarged by the distraction of its pillars and the hernia is worse in the puerperium, though incarceration is rare. Treatment of hernia is the same as at any other time when threatening symptoms occur. During labor it is not wise to allow too strong bearing-down efforts if the hernial tumor seems to be enlarging. Forceps should be applied soon after the dilatation is complete.

When possible all operations should be postponed until after delivery. Indications for opening the abdomen should be very strict during pregnancy. It may be advisable to empty the uterus as a preliminary measure. EDWARD L. CORDELL.

McLean J. H. Appendicitis in Pregnant Women. *Trans St J Med* 9 6 xii, 1906.

Since the childbearing period is the most susceptible time for appendicitis it must necessarily

follow that the two conditions occur simultaneously more frequently than is recognized. The general surgeon sees so many cases of appendicitis and so few pregnancies, while the obstetrician sees so many pregnancies and so few cases of appendicitis that both are likely to underestimate the seriousness of the combination until irreparable damage has been done. Pregnancy may be moving along smoothly enough until interfered with by old appendiceal adhesions or worse still by a sudden acute lesion with rupture. Pregnancy and a chronic appendix each react unfavorably upon the other. The acute appendix associated with appendicitis demands the same speedy removal as all other such appendices. Abortion is less likely to occur after appendectomy well done, and the mortality is no greater with an accompanying pregnancy than without it, providing abortion does not occur. McLean advises the avoidance of operation at a menstrual period. The operation should be done quickly with a minimum of handling of viscera and the use of gas-oxygen anesthesia. C. D. HOLMES.

Lewis, H. F. The Diagnosis and Management of Pelvic Affections Complicating Pregnancy. *Surg Gynec & Obst* 9 6 xiii, 1903.

Of affections of the uterus, the author considers only retroversion and rupture. Evil results of backward displacements of the gravid uterus are not common, but when they do occur are among the most serious complications of pregnancy. Such displacements are among the commonest of uterine disorders, and pregnancy is not rare in women who have them. In most instances the displaced uterus is spontaneously replaced as it enlarges and ascends into the abdomen.

The diagnosis can be made from reflex vomiting and nausea, from pressure symptoms, causing pains in the sacrum and lumbar back, and from symptoms of disturbance of the bladder.

Numerous cases are recorded where the gynecologist opened the abdomen, separated adhesions, and reduced the misplaced uterus. Some have even performed ventrosuspension or shortening of the round ligaments after having replaced the uterus. Of course most of the reported cases were successful. The author's opinion is that such suspensory operations upon the uterus are as unwise as they are unnecessary. If the retroflexed or retroverted uterus can be freed from the retaining adhesions and can be replaced in its normal position, it can be held there by light tamponade or by a soft round pessary for the short time which will elapse before it will be naturally retained above the superior strait on account of its increased size.

Where the pregnancy has advanced to the fourth month or beyond, it is seldom easy to separate the adhesions and reduce the uterus until after it has been emptied by abdominal operation. One should not wait for bladder symptoms, but should operate as soon as he has made the diagnosis and has found that he cannot easily reduce the displace-

ment under anesthesia. When the bladder symptoms appear the case is usually in a dangerous stage.

Rupture of the uterus during pregnancy may occur even in the early months, but is less rare the nearer the pregnancy approaches full term. The main and first diagnostic points are sudden shock with symptoms of internal hemorrhage.

The treatment of rupture after opening the abdomen will depend upon the extent and location of the rupture, the amount of hemorrhage, the chances of infection, and somewhat on the age of the patient. In some few instances it will be safe to clear out the uterus removing the fetus and secundines to suture the uterine wall as in cesarean section and to remove some of the fluid and clots from the peritoneal cavity. This procedure is only permissible when the rent is clean-cut and readily accessible, when the hemorrhage has not continued to the extent of apparent exsanguination, when the chances of infection are minimum, and when the woman is still young. Otherwise the uterus should be removed by supravaginal amputation.

Acute salpingitis does not call for operative treatment during pregnancy any more than under other circumstances.

A tubal abscess or other pelvic collection of pus, which points at the vault of the vagina, should be opened per vaginam, especially during the early months. It is best to drain such a source of infection before pressure of the enlarging uterus ruptures the abscess with consequent danger of peritonitis or other puerperal infection.

The frequency of ovarian tumors in pregnancy is 1 to 300. When the ovarian tumor causes disturbance from its presence during pregnancy, the most common complication is torsion of the pedicle which occurs in 80 per cent of such cases.

Torsion of the pedicle in ovarian cysts is more common in the first half of pregnancy than later and is rather more common at that period than in the non pregnant woman.

The prevailing opinion is that ovarian tumors should be removed if discovered during a stage in the pregnancy when they can be removed without great damage to the pregnant uterus. If discovered only at the time of labor or near labor and they are so situated that they are not interfering with the mechanism they should be allowed to remain and be removed after the puerperium. If so situated that they are imperiling the passage of the child and the pregnancy is so far advanced that a viable child may be expected, cesarean section should be performed with immediate removal of the tumor.

EDWARD L. CORNELL.

Andrews, E. W. *Diagnosis and Management of Acute Extraperic Conditions During Pregnancy*. *Surg Gynec & Obst* 1916 xiii 657

Problems are constantly occurring which could easily be solved by a conference between a surgeon and an obstetrician but which are not so easily

settled by merely asking the advice of an obstetric specialist. When to operate or whether to operate for an appendicitis that is latent, whether such an interference should be late or early in the pregnant whether it is more dangerous to leave such conditions untouched or to risk the termination of gestation — these are all problems upon which no two specialists agree either as to the fundamental principles or individual cases.

One authority considers the problem with most regard for the welfare of the mother another observer considers first of all the welfare of the unborn child and these different standpoints make it difficult to arrange our premises so as to arrive always at the same conclusion. Even if the science of midwifery has not settled all doubtful points, the obstetrician should have decisive authority and the general surgeon should feel his limitations very closely. The obstetrician should be the dictator and his judgment should override that of the surgeon in borderline cases.

No better summary of the surgeon's standpoint which in reality should rest upon what he has been taught by the obstetrician can be given than to repeat the rules laid down by Raeder.

1 Women expecting to be pregnant should be given a thorough physical examination.

2 Every functional defect should be corrected before pregnancy.

3 No operation which can be deferred should be performed during pregnancy.

4 Any operation which will contribute to the safety of the patient should be performed.

EDWARD L. CORNELL.

Lawrence, G. H. *Failing Cardiac Compensation During Pregnancy*. *B Mon M & S J* 1916 dxiv 858

Lawrence states that the classical signs of failing heart such as dyspnea, edema and tachycardia often appear too late to avoid catastrophe. Therefore, if patients with cardiac lesions are to be carried through pregnancy successfully it is necessary to recognize the minor signs of failing compensation. These are elicited by a careful past history and by certain functional tests. The past history often shows that the patient has had intermittent periods of feeling below par often accompanied by slight continued, unproductive cough and broken sleep. Occasionally there is a history of intermittent discomfort near the shoulder blade or slight pain in the precordia. With the patient under conditions of absolute rest certain functional tests should be tried. Taskal states that while normally the pulse-rate increases with the change from lying to standing this reaction is abolished early in pregnancy and its appearance means myocardial insufficiency. Schoonmaker has found that a decrease in systolic pressure and in pulse pressure following the change from the lying to the standing position or after moderate exercise has been associated with poor myocardial efficiency. In addition

the respiratory rate the urinary output and in cases of mitral stenosis the discrepancy between the apex and radial rates, or pulse deficit should all be observed. The author also believes that the effect of small doses of digitalis should be tested on all who have shown signs of decompensation as the drug will very likely be needed later on.

If the patient has had a previous break in compensation or numerous small periods of inefficiency of the circulation or if with mitral stenosis the latter only have occurred frequently sudden death or chronic invalidism is too often the result to justify the physician in advising the continuance of pregnancy. Should the patient elect to run the risk for the sake of a living child the author believes that she should be given small doses of digitalis more or less continuously and treated as ambulatory to prepare her for labor by avoiding muscular weakness and constipation. Abdominal distention should be guarded against by care in the use of digitalis, the elimination of carbohydrates from the diet and the division of the necessary amount of food into six small meals daily. Emergencies in mitral lesions due to acute dilatation call for venesection and for stimulation of the myocardium by digipuratum intravenously or strophanthin if the patient is free from digitalis.

In spite of the greatest care there will be unavoidable catastrophes. Pregnancy and imperfect cardiac compensation are incompatible either good compensation must be maintained under ambulatory conditions or pregnancy must be terminated.

F. C. I. VINE

Harris, S. H. Some Observations on Acute Renal Infection in Pregnancy and the Puerperium. *Med J Austral* 9 6 11 29

Thirty two cases were subjected to careful cystoscopic examination and treated by the retained ureteral catheter. They form in the main the basis for the subject matter of this report.

Twenty two of the patients were primiparae and ten multiparae. The pelvic capacity in each exceeded 4 drams, the average being approximately 7.5 drams the greatest was 3.5 ounces. Eleven other patients pregnant from sixteen weeks upward suffering from more or less vague, or in some cases severe pains in the region of the right kidney whose urine was full of pus and bacteria at the time of examination, were also subjected to cystoscopic examination. The pelvic capacity in each case exceeded 4 drams and relief of symptoms followed catheterization in all.

The right kidney was involved in every one of the 32 cases of this series, both sides in 6. In no case was the left side alone affected. In the 6 bilateral cases the left kidney was infected after the right and to a less degree, as though it were a secondary and ascending infection. The same extent of dilatation was never found in the left kidney though the cubic capacity in each case was above the normal—about 10 ccm. or 2.5 drams.

In every case of the series a pure growth of bacillus coli communis was obtained from the catheterized urine from the renal pelvis, though in 7 of the cases the bladder urine showed a mixed infection, with staphylococci in 6 and streptococci in one case.

These findings warrant the deductions that pyuria and pain confined to the left side are probably due to causes other than pyelitis gravidarum and that pyuria in pregnancy associated with other organisms in the renal pelvis than bacillus coli communis, probably owes its origin to some cause other than pyelitis gravidarum.

In 8 of the 32 cases the obstruction was situated from 6 to 8 inches above the ureterovesical orifice. In the remaining 12 cases no obstruction was detected by the ureteral catheter though in one case in which pycnography was performed the ureter was seen to be dilated to within about two inches of the pelvic brim. It is very probable that in some of these cases a tense psoas parvus tendon is a co-tributing cause of the ureteral obstruction.

The author's conclusions are

1. Pyelitis gravidarum is a pathological entity *per se*. It is characterized typically by dilatation of the right renal pelvis and ureter exceeding the capacity of a half-ounce. Ureteral obstruction at a short distance above or at the level of the pelvic brim, and by the presence of pus and bacillus coli communis in the urine.

2. Hydrourephrosis and hydro-ureter exceeding a half ounce associated or not with pain precede the onset of infection probably in all cases of pyelitis gravidarum.

3. The disease is either limited to or involves primarily the right upper urinary tract, the left being involved, if at all, later and to a less degree.

4. In the vast majority of cases, if not in all, the infecting organism is the bacillus coli communis.

5. When organisms other than or in addition to, the bacillus coli communis are found in the urine drawn by catheter from the renal pelvis, there is probably some cause other than, or in addition to pyelitis gravidarum. This does not apply in the case of urine obtained by catheter from the bladder which not infrequently shows a mixed infection in pyelitis gravidarum.

6. When in a pregnant woman there is pyuria and pain involving only the left kidney the condition probably owes its origin to some cause other than pyelitis gravidarum.

7. Serious cases, or even cases with persistent renal tenderness, especially if associated with a marked grade of pyuria and albuminuria, should not be permitted to drag on indefinitely but should be submitted to ureteral catheterization, or failing this, to induction of premature labor. Relief of the obstruction to the urinary flow is as urgently needed in this condition as it is in cases of stricture of the urethra, enlargement of the prostate, or in infected ureteral calculus.

8. The typical acute renal infection of the puerperium is essentially a different disease from pyelitis

gravidarum and is in most cases, a true ascending pyelonephritis analogous to the catheter fever and surgical kidney of the male genito-urinary patient though not necessarily due to catheter infection

EDWARD L. CORNELL.

La Roque G P : Surgery During and for Complicated Pregnancy Labor and Miscarriage Standardization of the Surgeon 1916 *M J Semi Month* 1916 xxi, 381

In the 40 cases reported by the author the following conditions were observed and the necessary operations performed

Two cases were operated upon for acute appendicitis in pregnancy at five months accompanied by pernicious vomiting. Though the pregnancy was uninterrupted the vomiting was relieved and there were no sequelae.

Varicose veins of the thigh and vulva were removed in a woman five months pregnant with no interruption of pregnancy.

Four desperate cases of pernicious vomiting of pregnancy required opening of the uterus at six and eight weeks respectively.

One case of active pulmonary tuberculosis was aborted at eight weeks. One two weeks pregnancy was interrupted with a routine curettage as a routine part of a trachelorrhaphy.

Immediate cure of a suppurative right pyelitis followed the evacuation of a five months pregnancy. Another similar case with stones in one ureter also had a similar subsequent history. In another case podalic version was resorted to with rapid delivery for pernicious vomiting. A violent case of eclampsia of nine hours duration was delivered by cesarean section with no subsequent convulsions but death followed in coma. Another hysterotomy was done for placenta prævia of two months duration while a third was done at term on a forty year-old primipara with delivery of a twelve and a half pound baby. A fourth cesarean section was made necessary by a violent eclampsia of ten hours duration and was followed by one convulsion and death in coma. Placenta prævia at four and a half months in a fifth case gave a perfect result. Ruptured tubal pregnancy was interrupted in four cases with perfect result.

A subtotal hysterectomy was done in one case for removal of an incarcerated posteriorly displaced uterus complicated by fibroids, two months pregnancy, and double suppurating salpingitis with pelvic peritonitis.

Another incarcerated posteriorly displaced uterus with continuous bleeding in a two and one-half months pregnancy required emptying and suspension.

One exploratory laparotomy for mistaken diagnosis of abdominal tumor was done. This was followed by a normal pregnancy and labor. The uterus was emptied of a large clot and packed for one case of violent postpartum hemorrhage the tenth day following labor.

Dilatation and curettage for incomplete abortion was performed eleven times.

One inflamed ovarian cyst complicated by pelvic peritonitis was removed during the puerperium.

In this series of 40 cases there were three deaths and one slight wound infection. In all the other cases convalescence was speedy and uncomplicated and cure was complete. C D HOWERS.

LABOR AND ITS COMPLICATIONS

Titus, P : Pubiotomy in Impacted Face Presentations. *Surg Gynec & Obst* 1916 xxii, 733

In a search of the literature Titus found but eight cases of pubiotomy for impacted face presentation. From analysis of these he concludes that the operation has a definite but restricted field of usefulness. His deductions are as follows:

Spontaneous delivery is held impossible in face presentation with the chin rotated to the hollow of the sacrum and craniotomy is the treatment advised even on living babes.

Face presentation occurs four times in a thousand labors in one per cent of all face presentations the chin rotates to the sacrum even though sufficient time and some assistance be given for anterior rotation.

Treatments outlined depend upon the causes of the anomaly and the stage at which it is diagnosed. The causes considered are moderate pelvic contraction, large fetal head and malpositions of the uterus. In general if the anomaly is discovered early it should be changed to a normal position.

If a face is not too firmly engaged it may be changed to vertex presentation by the maneuver of Baudelocque or Schatz, but if the face is moulded to the inlet it tends to again present. Internal version is therefore suggested unless contra indicated by long-ruptured membranes.

With the chin posterior and rotated to the hollow of the sacrum the face is impacted and cannot be changed to a vertex presentation nor unless the head be small can a spontaneous or forceps delivery occur. With a dead or moribund child craniotomy is indicated, but with mother and babe in good condition the author objects to craniotomy.

For the treatment of this complication reference to the obstetrical writers De Lee, Hirst, Berkeley, Bonney, Edgar, Cragin and Bumm finds pubiotomy but slightly mentioned if at all, preference being given either to cesarean section or craniotomy.

Combating the idea that pubiotomy for all indications is relatively the more serious operation Titus contrasts 810 pubiotomies showing a maternal mortality of 3.81 per cent and a fetal mortality of 7.09 per cent with craniotomies for 20 years at the New York Lying In Hospital showing a maternal mortality of 15.5 per cent and of course 100 per cent mortality for the babes.

Individual reports and individual opinions show pubiotomy to be even less hazardous. Mengo of Heidelberg had but one death a babe in 36 pubiotomies.

mies. Williams of Johns Hopkins had no fatalities in 43 pubiotomies. Williams and Doederlein hold that the mortality should not be above one or two per cent.

As an indication for pubiotomy Reed would include any malposition of the head in a normal pelvis not delivering in a reasonable time the condition of mother and babe being the criterion. Davis and Poucher admit no personal experience with the operation but base adverse criticism on the results observed. Poucher and Miller suggest abdominal section for impacted face presentation but the author points out that the mortality from pubiotomy under these circumstances is less than from cesarean section that it permanently enlarges the pelvic ring permitting future spontaneous births, while section requires repetition at each subsequent birth. He also mentions as factors militating against section its poorer prognosis after rupture of the membranes examinations other attempts at treatment, and the withdrawal over an aseptic field of a presenting part which had progressed down into the pelvis. Rongy is quoted as summarizing the relation between cesarean section and pubiotomy. Where cesarean section is indicated pubiotomy is contra-indicated and vice versa.

As a definite indication for pubiotomy the author gives face presentation with posterior rotation—engagement so deep being accepted as practical proof of no contra-indicating disproportion between the presenting part and the inlet the outlet alone having to be further considered.

In reviewing the literatureredit is given to Morse for compilation of 100 Morse found but four cases of pubiotomy for impacted face presentations. The birth of three out of four children is attributed not to the operation *per se* but first to the sphincter condition of the child before the operation was begun second to a contracted pelvis and head pressed down upon and not to the inlet or contra-indicating disproportion between inlet and presenting part third to prolonged delay for spontaneous delivery after performing pubiotomy. In three of the four mothers, the operation was harmless the fourth there was infection on of the operative incision streptococcal endometritis, thrombosis of both legs, but eventual recovery. The above four cases Morse adds a case of his own in which results were excellent.

Including the author's own case the literature discloses but three further pubiotomies done for this indication. Jacobson's, which showed nothing of the vagina from prolonged pressure of the fetal part. Williams which was successful in every way and the author's own in simple flat pelvis. In the last case there was an infection of the incision which granulated together in ten days with no sequelae. The patient also developed a tuberculous area at the base of the right lung. Her examination on discharge showed only shallow cervical lacerations and a shallow groove in the pubic bone, also an

apparently enlarged pelvic girdle. Examination a month after discharge showed callus formation and some mobility at the point of bony section.

All of the cases cited were poor surgical risks because of repeated examinations, long ruptured membranes actual disproportion between pelvic girdle and presenting part or prolonged pressure by the latter upon soft parts. Williams, quoting Routh gives the mortality for cesarean section in similar cases as 2.9 per cent when operated upon before rupture of the membranes 10.8 per cent after rupture 34.3 per cent after repeated examinations.

The author concludes

1. A reasonable test of the second stage should be allowed the patient in the hope that anterior rotation will take place either spontaneously or with the assistance of carefully performed manual attempts at rotation.

2. Attempts to rotate by means of forceps are dangerous to both the child and the mother.

3. Cesarean section is directly contra-indicated because of its high mortality in these cases.

4. Craniotomy is the operation of choice if the child is dead or in extremis but it is by no means as innocuous as is generally assumed.

5. Pubiotomy is the operation to be selected in those cases where the child is alive and in good or even fair condition, and craniotomy on a living child presenting in this fashion is entirely unjustifiable. JAMES D. COOK.

Sachs, E. Clinical Significance of Prolapse of the Arm in Cephalic Presentations. *Zentralbl. f. Gynäk.* 9, 13.

Sachs article deals with the statistics gathered in the Women's Clinic at Koenigsberg. In 13,000 births prolapse of the arm was noted as frequently in front of the head as behind it. Among the most frequent causes may be mentioned strictured pelvis, excessive child bearing, hydramnios, pendulous abdomen and twin pregnancy. Other abnormal phenomena frequently accompanied prolapse of the arm, such as prolapse of the cord and of the feet disturbances in the course of the labor, anomalous engagement of the head, etc. Of the 56 cases in which prolapse of the arm was observed, spontaneous birth without intervention was observed in 13 only and only in four of these was the child alive and well delivered without any maternal lesion. Rupture of the uterus occurred in two cases, which is always to be feared even when the size of the child and the width of the pelvis keep normal relations and even if the head is already profoundly engaged.

The author shows by his exposition that prolapse of the arm should always be corrected. He obtained good results in 20 cases by replacement of the arm in its position and in 3 cases by version and extraction of the foetus. The prognosis for the mother is favorable however there is some danger for the child. In the 56 cases 7 infants were already dead before the moment of birth. Of the remaining 49 only 43 were born alive and of these 1

died of asphyxia and 7 more of different other causes. There were 15 deaths altogether — 26.8 per cent of the cases. W A BRENNAN

Massini, I. C.: The Application of Forceps in the Superior Strait (La aplicación de forceps en el estrecho superior) *Semana Méd.* 1916 xxiii, 483

Regarding the divergent views of obstetricians on the question of high forceps application Massini believes that when there is no vicious pelvis or no exaggerated disproportion between the foetal and maternal diameters high forceps application is as beneficial and as necessary as it is when applied in the excavation or in the vulva. There is only one difference and that is that the application is more difficult and the high forceps may be fatal to the mother and child unless guided by a trained hand.

The anteroposterior application of forceps fell into disuse owing to Champetier's opposition to it. Budin also in 1898 expressed the view that such manipulations should not be made. Pinard's view that no matter what the height and orientation of the foetal head it must be seized regularly has gained confirmation by degrees.

The author's experience with the application of forceps in transverse presentations of the vertex above the superior strait leads him to these conclusions:

1. High forceps although difficult of application ought in many cases be preferred to version and to sanguinary operations.

2. Anteroposterior application taking a regular hold ought be preferred, since it is the least removed from the correct hold.

3. The discussions so widely sustained by obstetricians with regard to the three classic holds which may be made in transverse positions above the superior strait show that none of these exactly fulfill the conditions which characterize an ideal hold consequently they make adjustment difficult, retard descent, and traumatize the fetus.

Under such circumstances Massini thinks it well to suggest an anteroposterior application with regular hold which although atypical offers advantages over the anterior and which he distinguishes by the name of inverted forceps. W A BRENNAN

Pierce, G. H.: Forceps Rotation in Persistent Occipitoposterior Positions. *Internat M J* 1916 xxiii, 1033

To spare the child the injuries from prolonged pressure against the vertex and the mother from deep lacerations of the soft parts to convert a protracted labor into a shorter one to prevent exhaustion of the mother and possible sepsis from lacerations in some cases even to make possible the advance of the head and the birth of a living child are the reasons advanced for the application of forceps in occipitoposterior positions.

In order that forceps rotation may be properly performed the vertex must be low in the pelvis and

preferably not until it has reached the pelvic floor and is even on the point of distending the vulva. Forceps rotation in occipitoposterior positions is indicated only in cases where it is persistent, i. e. where the occiput is unduly delayed or will not rotate to the front after it is in the cavity or on the perineum. EDWARD L. CORNELL

Hellman, A. M.: Rupture of the Uterus. *Internat J Surg* 1916 xxix, 356

The importance of rupture of the uterus is due to the suddenness with which this accident occurs and to the bad prognosis which it gives. Tears of the cervix and perforation of the uterus are not included in the discussion, though Hellman states that anatomically they are ruptures.

The predisposing etiological causes he gives as

1. Cesarean scar
2. Fatty infiltration of the uterine muscle in obese subjects.
3. Frequently repeated pregnancies.
4. Overdistention of the uterus.
5. Adherent placenta in a previous labor
6. Sepsis after a former labor
7. Eclampsia in a former pregnancy
8. Diseases tumors or malformations of the uterus.

9. Cacheria.
10. Interstitial pregnancy
11. Cervical implantation of the placenta
12. Adhesions of the uterus to surrounding tissues.
13. Dystocia from any cause.

The direct causes mentioned are

1. External violence.
2. Obstetrical operations.
3. Violent contractions of the uterus with formation of a Bandl ring

The frequency is quoted as variously estimated from one in 234 deliveries to one in 600 deliveries.

The most characteristic symptoms are sudden, severe sharp short pain shock, and symptoms of internal hemorrhage. A change occurs in the shape of the abdomen and there is a slipping away of the presenting part. Shortly after the rupture the patient as a rule improves and then in a few hours goes into further collapse and signs of peritonitic irritation appear. Vaginal examination under an æsthesia plus an intra uterine examination if needed should easily establish the presence or absence of rupture.

Incomplete tears are tears into the broad ligament and can be treated conservatively by tamponade, ice bag, ergot, and the application of methods to combat the shock — providing the fetus has been removed. Complete tears require laparotomy with removal of the fetus and placenta and either suture of the uterine wound with drainage or hysterectomy with drainage.

The prognosis is always bad. It is worse after complete than after incomplete rupture. The prognosis is better the less the infection that has been introduced from without. The earlier the

diagnosis is made and treatment instituted the better the outlook. The patients die of early or late shock, or of sepsis or peritonitis, or a combination of these with or without loss of blood.

Adair, F. L. The Use of Pituitary Extract for the Induction of Labor. *Ist M J* 9 6 xviii

The use of pituitary extract for inducing labor particularly in premature, mature, and postmature cases should not be abandoned.

It appears to be of all inducing of labor in premature cases in some instances and is worth a trial where it is not necessary to end the pregnancy rapidly.

In cases with ruptured membranes it is of value in initiating uterine contractions.

In cases of placenta previa marginalis or lateralis where the membranes rupture, are ruptured or tubercally it is of all inducing of contractions and may save the necessity of intra-uterine manipulations.

It is a help in cases where mechanical means are used to induce labor and may limit the amount of manipulation on necessary.

In cases at term it is of value in starting labor.

It should be used in cases going overterm before any other method of inducing labor is resorted to except those cases where it is contraindicated or it is necessary to terminate the pregnancy more rapidly.

EDWARD L. CORRELL

MISCELLANEOUS

Routh, A. The Importance of Getting a Pregnant Woman Under Medical Supervision and Affording Her the Necessary Treatment. *Lancet* Lond 9 6 55.

As a result of increased interest in the unborn child a large number of antenatal clinics and maternity centers have been instituted with the primary object of trying to save the child but also indirectly benefiting the mother. There are 750 maternity centers in Great Britain and Ireland.

Until a few years ago women who came to be registered for their confinement in the indoor or extern departments of many general hospitals had their names and addresses taken down by the obstetric house physician who may have had no previous acquaintance with the diseases of pregnancy and often had very little spare time. It was optional for him to examine, or omit to examine the patient or to test her urine. Now opportunity is taken to utilize the registrar or of expectant mothers by making it, and sometimes calling it an antenatal antenatal clinic greatly to the advantage of patients and students, and the department is usually in charge of the obstetric registrar or tutor or even of the assistant obstetric physician or surgeon. Some arrangement is also made for preterm delivery wards or for beds in the maternity ward for pregnancy complications.

Whether therefore the question of medical supervision during pregnancy be considered from the point of view of the welfare of the mother and unborn child or as an educational stimulus to the mother or from the standpoint of the increase of pathological chemical and therapeutical knowledge for the profession there can surely be no real difference of opinion that every pregnant woman should be seen by a doctor and then have such supervision as her condition requires.

EDWARD L. CORRELL

Kellogg, F. S. Prenatal and Postnatal Care. *Ist M J* 9 6 xviii 7

Pregnancy has for prenatal care will grow if started will be accepted by the people and will educate them rapidly as to the value of prenatal care.

The following statements demonstrate the value of prenatal care.

Thirty per cent of pregnancies show some abnormality.

Four per cent of pregnancies show definite symptoms of toxemia.

Eight per cent of pregnancies show some degree of contracted pelvis.

Seven tenths of one per cent of pregnancies show antepartum bleeding.

Two per cent of all pregnancies are complicated by valvular heart-disease, 1 per cent of which decompensate to some degree under pregnancy strain.

Prenatal care reduces maternal mortality on the whole especially from toxemia and eclampsia.

Prenatal care reduces maternal mortality in placenta previa.

Prenatal care reduces maternal mortality in contracted pelvis and morbidity following labor in these cases.

Prenatal care gets cardiac disease complicated pregnancy to the hospital for treatment when decompensation is slight and so reduces maternal mortality this disease.

Prenatal care reduces stillbirths.

Prenatal care reduces foetal mortality in contracted pelvis and in toxemia.

The pregnancy clinic offers an ideal place in which to teach many sides of obstetrics.

Pregnancy clinic material in the well-conducted hospital with a good follow-up system in connection with the hospital offers very valuable data in the study of obstetrics.

Postnatal care is nearly or quite as important as prenatal care and, except in one-child sterility, is essentially prenatal care and should be extensively incorporated into the work of the individual obstetrician of a pregnancy clinic, and of a lying-in hospital.

EDWARD L. CORRELL

Davis, C. H. Some Problems in the Use of Nitrous Oxide and Oxygen in Surgery and Obstetrics. *Ist M J* 9 6 xviii, 33

A critical study of 154 consecutive deliveries at the Presbyterian Hospital Chicago shows that the

babies of 67 primiparæ who had the analgesia, with an average weight of 7 pounds 5 ounces at birth, lost 6.7 per cent of their body weight. On the other hand the babies of 18 primiparæ delivered under ether or no anæsthetic, lost 7.14 per cent of a 7-pound average birth weight. The average labor of the women given the analgesia was five hours and fourteen minutes shorter. In spite of the fact that the average weight of their babies was 5 ounces more. Relieving the pain lessens the shock of labor and the mothers being in better condition are more apt to have a good milk supply. Conserving the health and strength of mothers means better mothers and healthier babies. Nitrous oxide being the least toxic of anæstheticising agents seems the logical analgesic to use during the ordeal of childbirth.

Nitrous oxide-oxygen analgesia and anæsthesia in surgery and obstetrics has entered a new era. The future will find this anæsthetic more and more employed. It has very definite limitations, but has many possibilities heretofore not appreciated.

EDWARD L. CORNELL.

Hoag, C. L.: The Application of Anæsthetic Association to Obstetrics: the Combined Use of Scopolamine, Nitrous-Oxide-Oxygen, and Local Infiltration. *Surg Gynec & Obst* 916 xliii 612.

The principal objections to the use of gas alone seem to be that there is a lack of muscular relaxation under nitrous-oxide-oxygen. When we remember how many surgeons have discarded it on account of the lack of relaxation in the abdominal wall, we cannot help feeling that the percentage of severe perineal tears must rise unless the pelvic muscles should happen to be very different in their reactions under the gas.

The author reports on 30 cases receiving perineal injections. Of these 20 were given nitrous-oxide only, 4 were given nitrous-oxide-oxygen until the time of actual delivery when chloroform or ether was substituted, and 6 received chloroform in the usual way. The perineum in all cases was injected with 0.25 per cent novocaine, varying in amounts from 60 to 150 ccm. Eleven received in addition, from 30 to 40 ccm. of 1 per cent quinine-urea solution each. The maximum amount of the two solu-

tions injected in any one case was 175 ccm. The injection was made as the head appeared in sight. The vulval edges were turned back and a long needle inserted at the mucocutaneous border the fingers of one hand being in the vagina to note its position. At this period the perineal floor is flattened out by the oncoming head but not stretched to any degree. Even though the field is large both the levator ani muscles and the perineal body can be readily infiltrated. Novocaine was injected first and the quinine urea immediately afterward, when used.

Seventeen received from one to five doses of scopolamine during the first stage before nitrous oxide-oxygen was begun. The initial dose of scopolamine was 1/200 grain combined with either morphine 1/6 grain or narcophine 1/4 grain. This was usually followed at irregular intervals by the same dose of scopolamine without the morphine or narcophine. In four of the prolonged labors a second smaller dose of either the morphine or narcophine was given. These drugs were given, first to reduce the amount of gas used and secondly because many of the nervous patients became more quiet and took the anæsthetic better. During the delivery of the head analgesia was succeeded by complete anæsthesia in all cases.

In conclusion, the author emphasizes the following facts from his experience:

1. Nitrous-oxide-oxygen analgesia is safe to mother and child.
2. The use of limited amounts of scopolamine during the first stage is a distinct advantage shortening the time during which gas is required and making the analgesia more complete.
3. The injection of the perineum is a distinct help in securing relaxation of the outlet. This point gained gas-oxygen, in experienced hands will do as well as chloroform or ether. The lack of any complication whatsoever resulting from the perineal injections should encourage those who feel timid about its use.
4. The combined use of scopolamine nitrous-oxide-oxygen, and local infiltration offers a practical and efficient means of conducting labor and extends anæsthesia in its broadest sense to the obstetrical field.

EDWARD L. CORNELL.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Valentin, B. Suprarenal Hemorrhages Their Symptomatology; Difficulty of Diagnosis. *Berl klin. Wchnschr.* 9 6 N 9

Valentin points out that it is only rarely that there is occasion for surgical intervention on the suprarenal glands. In recent years a morbid condition which showed extensive hemorrhage in the perirenal tissues has been repeatedly observed. Koch was the first to direct attention to it and he described a case operated upon by Ritter in which an acute paralytic ileus was due to a conspicuous retroperitoneal hemorrhage from the left suprarenal gland.

There is frequently an anatomic-pathologic finding of millary suprarenal hemorrhage which is not clinically of importance but it is different from the conspicuous hemorrhagic collections mostly bilateral which either themselves or by the destruction of the suprarenal tissues may cause sudden death. Vincent reports a case in a woman of 4 in whom on the basis of the symptoms diagnosis of appendicitis and ileus was made. On laparotomy the appendix and intestine were found normal and the abdomen closed. Death occurred six days after. At the autopsy the suprarenal glands were found converted into hematoma. The predominant symptoms thus as in all other cases were peritoneal irritation accompanied by abdominal pain, vomiting and eventually collapse. The pain on the right side corresponding to the extension of the hematoma, was greater than on the left which suggested the probability of the diagnosis of appendicitis.

Valentin does not believe that the peritoneal manifestation can be explained by the mechanical fact of the peritoneal distention by the compression of the hematoma. He refers to some experimental researches of Finl in which suprarenal gland lesions apparently caused marked alteration in the stomach mucosa, circulatory disturbances, edema, hemorrhage, and necrotic degenerative processes including ulcerations. He also demonstrated that in cases of gastric and duodenal ulcers there were notable alterations in the suprarenal glands. The researches seem to point to reflex irritation of the splanchnic nerve. In Valentin's own case the ileus, vomiting and analogous symptoms could not be attributed to the finding of blood in the peritoneal cavity as in this case there was none.

Other characteristic symptoms of suprarenal hemorrhage are the small pulse, lowered pressure, and low temperature. A diagnosis of suprarenal hemorrhage has never yet been made during life

prior to operation. The prognosis is absolutely hopeless if both the suprarenal glands are destroyed by abundant hemorrhage.

The question arises whether death is caused by the deficiency of the suprarenal glands. The author cites some cases to show that a unilateral hemorrhage even if very abundant and unilateral destruction of a suprarenal gland, is compatible with life and the prognosis is not grave as in bilateral lesions. But the cases on record are too few to draw definite conclusions.

With regard to the causes of the hemorrhage according to Simmonds venous thrombosis is the most frequent especially in patients with chronic disease.

W. A. BREXMAN

Call ja, C. Results of Operations Practiced for the Extraction of Renal Calculi with Special Reference to Nephrolithotomy (Resultados de las operaciones que se practican para extraer los calculos renales con especial referencia a la nefrolitotomía). *Rev d med y cirurg pract Madrid*, 9 6 1911 44

Many physicians are apt to compare renal calculi with biliary calculi. Biliary calculi while very frequent are generally innocuous and they are not often infected while in renal calculi the opposite is the rule.

The author recommends immediate surgical intervention as soon as a diagnosis is made of renal calculi. In the general run of cases nephrolithotomy will be done reserving pyelolithotomy and nephrectomy for a small number with special indications. In the first named operation the mortality in some statistics does not exceed from 2 to 3 per cent.

If there is bilaterality of the nephrolithiasis, inasmuch as in the hands of surgical experts the mortality reaches 30 per cent and in the surviving cases there is a large percentage of fistula the author is of the opinion that where the stones in one kidney are not very large and there is little infection there should be abstention from operation since the probability of obtaining any benefit is small and the danger of death is great.

W. A. BREXMAN

Fieschi D. Artificial Grafts in the Fixation of Movable Kidney (Innesti artificiali per la fissazione del rene mobile). *Ci cli Mila* 9 6 1911 875

Fieschi criticizes the various procedures for fixation of movable kidney all of which he thinks lead to a disturbance in a greater or less degree of the integrity of the organ. In his researches he has sought a method (1) which will obviate the necessary

recovery of the patient by secondary intention (provision of adhesences) (2) that will obviate the inconvenience of the use of the fibrous capsule and resulting hemorrhage, (3) that will obviate the passage of sutures through the parenchyma of the organ.

To reach these desired ends the kidney is inserted in a sac cut by the operator from a specially prepared sheet of rubber. This sac is sutured around the kidney provision being made for blood and urine passages. The suspensory sac is sutured by metallic sutures to the eleventh and twelfth ribs posteriorly and anteriorly.

Fleschl thinks that in time adhesences will form which will be a further aid. He has operated in this way on two patients in December 1914, and March 1915 respectively. The results up to the present are excellent in every way in both cases. The operation must of course be carried out under rigid asepsis. The method of folding the kidney in the sac is illustrated.

Fleschl claims for his method the following advantages: (1) It prevents in a thorough and durable way the re-descent of the kidney while holding it easy and elastic. (2) It does not provoke any kidney hemorrhage. (3) While not permitting re-descent the kidney is free to adapt itself otherwise to the exigencies of its vicinity. (4) Pressure from the vicinity is deadened by the morbid elastic mass. (5) This elastic mass besides with its greater volume reproduces for the kidney that connective atmosphere, the disappearance of which is constantly stated by all authors to be among the precipitating causes of the pathogenesis of movable kidney.

W. A. BRENNAN

Cunningham J. H. Jr: Large Solitary and Multiple Cysts of the Kidney. *Surg. Gynec. & Obst.* 96 xliii, 688.

The author presents details of four personal cases of large cysts of the kidney and reviews the literature in this connection. He states that large, solitary serous cysts producing tumors, are very uncommon and are probably due to some undiscovered obstruction in the uriniferous tubules and the continued excretion of urine. They are generally unilateral and are considered by those who have studied the subject to be large retention cysts.

They occur more often in women than men, generally on the right side and in adult life. The cysts are usually located at one or the other of the poles of the kidney; occasionally cysts occur in the body of the kidney. Their size varies from that of an orange to a cyst recorded by Rendin which contained 10 liters of fluid. The contents of the cyst may be of a clear serous character or may be urinous, turbid, gelatinous, bloody or caseous. The fluid usually contains albumin and urea and colloid material has been found in some cases as well as phosphates, sulphates and chlorides. The specific gravity has been between 1.010 and 1.020.

These cysts produce no particular set of symptoms and the urine remains normal unless there is coexist-

ing disease which produces changes in it. These cysts are frequently mistaken for ovarian tumors, gall-bladder disease, or hydronephrosis. The correct diagnosis is often made only at operation.

Regarding treatment the author feels that nephrectomy should be avoided wherever possible. Aside from the loss of an organ with but little if any impairment of function it is important to realize that the other kidney has not undergone a vicarious hypertrophy because of the nature of the malady and is in no condition to undertake the work suddenly thrown upon it by the loss of its mate.

In cases where there is little or no impairment of function of the kidney which is the seat of the cyst, resection of the cyst is the operation of choice. Emptying the cyst content and suture of the edges of the cyst to the skin is the least severe operation and is of value when the patient is in poor condition or the cyst very large. This method should be employed however when it is not advisable to resect the sac or perform a partial nephrectomy.

HENRY L. SANFORD

Brasch W. F.: Clinical Data of Polycystic Kidney. *Surg. Gynec. & Obst.* 1916 xliii, 697.

Forty-one patients have been operated upon in the Mayo Clinic up to May 1, 1916, who were found to have polycystic kidneys. Of these 26 were recognized clinically before operation. Brasch summarizes the subjective symptoms under the following heads: (1) pain, (2) hematuria, (3) renal inefficiency, (4) blood pressure, (5) urinary data, (6) phthalein estimate, (7) microscopic data, (8) tumor and (9) pyelography.

1. Pain usually occurred as a dull heavy ache referring to the loin, excepting when there is an interference with drainage or when infection occurs.

2. Hematuria occurred in 16 cases, 40 per cent. It was usually profuse and each attack lasted from several days to several months. In 6 cases it was described as occasional and in 8 as continual. The presence of blood-clots is no doubt the cause of the excruciating pain in many cases.

3. The several clinical symptoms of renal insufficiency were vomiting and nausea unaccompanied by cardiac disease but having the clinical symptoms resembling interstitial nephritis.

4. In only 7 out of 16 patients was the blood pressure normal in the remaining 9 the blood pressure was between 240 and normal. Extremely high systolic and diastolic blood pressure with specific gravity as low as 1.003 and only a trace of phthalein contra indicates even a Rovsing operation.

5. Brasch thinks that a low specific gravity is of considerable prognostic importance as regards the urinary data.

6. The phthalein estimate was made in 11 patients. In 5 it was found to be from 40 to 73 in 2 it was 30 and 40 in 2 it was 29 and 22 respectively, and in 2 there was only a trace. The last two patients died following operation. Only a

trace of phthalein in two hours usually excludes all operative procedure.

7. Red blood cells were found in all but one of the 41 cases. Casts were found in 5 cases. The ophthalmoscopic examination was negative in every case.

8. Renal tumor was noted in 31 of the 47 patients. In 3 the enlarged kidney was mistaken for the liver.

9. The pelvis of the kidney is frequently deformed under the following heads: (1) flattening and obliteration of one or more major calyces; (2) retraction and broadening of the various major calyces; (3) elongation of the true pelvis; (4) displacement of the pelvis from its usual position.

Various forms of surgical treatment are discussed.

1. In 14 cases nephrectomy was performed with the result that 10 of the 3 patients traced are well.

2. Exploration for unilateral renal lesion was done in five cases. Of these patients 2 were explored on account of unilateral tumor. In the others, either abdominal complication or evidence of renal insufficiency was present.

3. Polycystic kidney was discovered in 8 cases at operation. In 5 there was no clinical evidence in 3 the clinical evidence was masked by other conditions.

4. The Rovsing operation was performed on 10 patients. In 7 the condition was recognized clinically prior to the operation 3 died. Of the remaining 7 all are practically well from one to four years after the operation. Four cases were found postmortem.

5. Twenty-one cases were observed in which the clinical diagnosis of bilateral kidney was evident but were not explored surgically and definite proof was lacking.

In conclusion Braasch states that with a blood pressure of 100 clinical symptoms of toxemia, a reduced functional test and urea in the blood operation is attended with considerable danger. When this condition is present in moderate degree however the Rovsing operation is followed with considerable benefit. It is particularly valuable in controlling hematoma.

Nephrectomy is indicated only in widespread infection and when it is certain that the opposite kidney is functioning correctly. A. C. SROGA.

Macht D. I. The Pharmacology of the Ureter; Action of the Opium Alkaloids. *J. Pharmacol. & Exp. Therap.* 9:6 v. 97.

In two previous communications the author has described the action of epinephrin, ergotoxin, nicotine, and of drugs affecting the sacral autonomic endings of the ureter. The purpose of the present paper is to report the effect of some of the opium alkaloids individually and in combination on that organ. The action of these alkaloids, as will be shown is of considerable interest not only scientifically but also from the practical clinical point of view.

The methods of studying the effect of various opium alkaloids on the ureter was the very simple and convenient ring method, described in the author's previous papers. In case of the drugs which are of clinical importance—namely morphine, papaverin and pantopium, observations were also made on the ureters *in situ* (rabbit) and lastly the action of the more important substances was tested, whenever obtainable on rings of the excised human ureter from cases of nephrectomy. The results obtained with the same drug by the different methods agreed perfectly.

The author divided the opium alkaloids in respect to their action on the ureter *in vitro* and *in corpore* into two groups, according to their chemical structure—the pyridin-phenanthrene group of which morphine and codeine are the chief representatives, and the benzyl-isquinoline group of which the most important members are papaverin and narcotin.

Morphine and its allied alkaloids increased the contractions and produced a greater tonicity of the ureter.

Papaverin and its allied alkaloids produced a slowing or total inhibition of the contractions and a relaxation of the tonus.

In pantopium (total opium alkaloids) and other combinations the effect of the benzyl-isquinoline alkaloids predominated.

In spasmodic conditions of the ureter (renal colic) the employment of papaverin or total opium alkaloids was more rational than that of morphine alone.

The slight toxicity of papaverin is lower tonus power and its local anesthetic properties suggest to the author its local application in spasmodic conditions of the ureter. Geo. E. BRILEY.

BLADDER, URETHRA, AND PENIS

Legueu, F. Vesical Calculus in Bladder Injuries (Des calculs vésicaux chez les blessés de la cavité). *Bull. Acad. de Méd. Paris* 9:6 1877, 445.

In 3 bladder wounds Legueu has observed the formation of calculi 10 times occurring at a period more or less remote from the injury. Infection cannot be the cause because all bladder wounds are infected and the infection in the calculus cases is not longer in duration nor more intense than in the others. Legueu has observed that the calculi are produced only in those patients who at the time of the vesical injury suffered a fracture of the pelvis also. In the 10 cases of calculi he found 10 fractures of the pelvic girdle and in the other 25 patients there was no fracture and not a single calculus. He is, therefore, of the opinion that the calculus is the indirect and late consequence of a concomitant and communicating fracture. When a foreign body enters the pelvic cavity it almost always breaks some bone in its passage and causes a doubly complicated fracture from the fact that it is in communication with the perforated bladder and with the exterior. On the one hand urine passes to the scene of the fracture and on the other pieces of the

fractured bone reach the bladder where they are found either solidly implanted in the bladder wall or included as the nucleus or a calculus. Long after external clatrazation has taken place by the cystoscope one can discover the existence of an osteopathic fistula joining an osteomyelitic center with the bladder. The bony particles which are borne into the bladder become the nucleus of crystallized calculi. In the treatment Legueu believes it is a mistake to endeavor by an external operation to close the fistula and remove the calculi, etc. as in effect it puts the patient in the same condition he was in eight or ten months before with a perforated bladder and an external aperture. He has adopted lithotripsy in the majority of his cases and he thinks this is the best treatment, curing the patient in a few days. Even in cases where the calculi have a nucleus or bone particles which cannot be crushed the experienced surgeon will be able to extract them through the urethra when the calculous element is removed. There is of course the liability to fresh formations but these can be dealt with in the same manner and in time the osseous fistula will spontaneously become effaced.

W. A. BRENNAN

Maralini B.: Treatment of Tumors of the Bladder (Tratamiento de los tumores de la vejiga) *Rev. Asoc. Méd. Argent.* 1916 xiv 180.

Maralini thinks that the treatment of choice in papilloma of the bladder is the high-frequency current. In malignant neoplasms and those of a very great size extirpation of the tumor by the hypogastric route is preferable, with subsequent treatment of the pedicle and recurrences if produced by high frequency currents.

In extensive infiltrated neoplasms which are not amenable to extirpation high frequency currents are beneficial in suppressing hemorrhages and stilling pain. In carcinomata and sarcomata high-frequency currents do not give good results.

The advantages of high frequency current treatment are: (1) There is no necessity for anesthesia. (2) Intervention is made under full view. (3) There is no provoked pain nor reaction. (4) No hemorrhage is produced and if such exists already the first application checks it. (5) There is no resultant superficial ulcer nor scar. (6) The patient can continue his occupation during the treatment. (7) The destruction of the tumor can be watched step by step by cystoscopy.

The time required however is long and depends on the size of the tumor also if there is an accompanying cystitis the vesical irritability may be increased.

W. A. BRENNAN

Bartels, L. G. and Halsted F. S.: Tumors of the Bladder and Their Treatment with High frequency Cauterization *J. Mo. St. M. Ass.* 9 6 xiii 550.

The early diagnosis and prompt treatment of tumors of the bladder are of the utmost importance

tardiness in diagnosis being due not so much to the lack of symptoms as to the lack of proper interpretation of their seriousness. The most prominent symptom is hematuria, usually an indication of serious trouble. In the diagnosis of bladder tumor the cystoscope is an absolute necessity small papilloma being discoverable and their removal made possible by minor measures.

High frequency cauterization should be the method of choice in treating any papillomata of the bladder and those who make use of this current must classify the signs of malignancy according to an entirely new point of view a clinically malignant tumor being one which is not curable by the use of the high frequency current. The danger of complications or of death are entirely eliminated with this method while recurrences are far less frequent than after the open operation.

Fulguration of indurated malignant growths of the bladder have proved entirely useless.

E. K. ARMSTRONG

Umana R.: A Case of Lobular Epithelioma of the Penis (Un caso de epiteloma lobular del pene) *Anal. d. Hosp. de San José Costa Rica*, 1916 i 15

This case is reported by Umana to show the importance of early diagnosis. The patient came to the hospital more than a year before for a small ulceration of the penis in the prepuce region. He was treated by various methods for two weeks and left the hospital without any favorable results. He returned some months later showing an inflammatory phimosis which prevented the lesions being seen but two hard tumefactions could be palpated through the prepuce. An intended operation was not carried out owing to lack of a secure diagnosis and the patient again left the hospital. He returned again for the third time. The penis was then enlarged and deformed. The prepuce was intimately adherent to the gland the two tumefactions previously observed showed in the form of large round, excavated crateriform ulcers. Biopsy shows that the formation is a lobular epithelioma for which amputation of the member is imposed.

The author believes that this is a case of primary epithelioma. There is no evidence of it being an epitheliomatous transformation of a syphilitic ulcer. Earlier diagnosis of the true condition would have avoided the operation now necessary.

W. A. BRENNAN

GENITAL ORGANS

McKenna, C. M.: Surgical Treatment of Acute Epididymitis. *Illinois M. J.* 1916 xxi, 398

The author discusses the surgical treatment of acute epididymitis presumably of gonococcal origin. He takes up the anatomy of the testis and epididymis and in so doing explains the intense pain produced by pressure of hydrocele fluid on the scrotal contents. He also emphasizes the point that in inflammation of the tubules of the epididymis causes

a stenosis of the lumen and also shows that if the pus is drained off early this stenosis is less likely to occur. He has operated upon eleven such cases in this way and his conclusions are as follows:

Surgical procedure is necessary only when the patient is suffering excruciating pain. When this procedure is carried out it is quite necessary to divide the fascias so as to free the tension from the testicle as well as the epididymis. Patients are less apt to be impotent if the posterior wall is divided carefully and the pus drained off than if left to Nature to absorb. A blind stab operation is that of a fakir and should not be considered. It is not enough to expose the epididymis and drain it but all the fascias should be free. It is not necessary to split the epididymis but only the infected chamber which stands out clearly. J. D. BAKER

Wilms: Hypertrophy of the Prostate. *Muenche med Wchschr* 96 N. 3

Wilms discusses the results of X-ray treatment in the cure of prostatic hypertrophy.

There is no doubt but that in certain cases irradiations produce considerable amelioration, and it is believed that these can effect a notable reduction in the volume of the gland.

It is generally considered that the decisive element is the influence of the hypertrophied parts of the prostate and it is believed that a notable reduction of the volume of the gland can be obtained by irradiations. With the customary dosage—50 to 60—Wilms could not secure any sensible reduction in the volume of the gland. Hence some other explanation must be sought to explain the amelioration in certain cases. He points out that no part of the symptoms in prostatic hypertrophy is due solely to the increase of volume but to inflammatory alterations which are contemporaneous. According to this the cause of such disturbances must be sought in the effects of products of disintegration of the glandular cells, also in vascular and lymphatic products. These substances seem to be able to provoke an irritable condition in the nervous system which explains the painful stimuli on micturition and the spastic condition of the vesical sphincter which is present in prostatic cases. It is well known that X-ray treatment can completely suppress inflammatory alterations and it is to these effects in suppressing inflammatory conditions that Wilms attributes the ameliorating influence which the X-ray exerts in

certain cases where there is a spastic irritable condition accompanying prostatic hypertrophy.

W. A. BREDMAN

Peacock, A. H. Blood Pressure and Prostatectomy. *Ann Surg Phila.* 196 1d. 659.

The author states that there is a direct relation between the degree and duration of an obstruction in the lower urinary tract and the blood pressure and reports 7 cases of prostatectomy with blood pressure observations. These cases illustrate the fall in blood pressure that accompanies a relief of the obstruction and the consequent back pressure on the kidneys. The sudden relief of the obstruction with the consequent lowering of the blood pressure to a level insufficient to secure adequate kidney function precipitates an acute nephritis. This is the real cause of the high mortality of prostatectomy not shock or hemorrhage.

In the 7 cases operated upon there was a fall of blood pressure of from 90 to 110 mm Hg upon the relief of the obstruction by simple cystotomy.

After a study of his cases Peacock concludes:

There is a definite physiologic relation existing between the blood pressure and the filtration in the kidney glands.

1. A high blood-pressure is purely compensatory and necessary to the individual in which it is found to maintain a normal excretion of urine.

2. Any sudden and permanent lowering of the blood pressure by radical or heroic measures is often a fatal procedure.

3. A persistently high blood pressure even in the absence of albumin and cast usually means a hidden nephritis.

4. A chronic prostatic obstruction produces serious back pressure changes in the ureters, the kidney substance, the kidney circulation, and the excretion of urine.

5. A sudden relief of this intra-vesical pressure produces an immediate fall in blood-pressure, from 100 to 80 mm Hg.

6. If pre-operative blood-pressure is much over 90 mm. Hg. the risk of a cystotomy or prostatectomy advances rapidly.

7. Compensation between the blood-pressure and the urinary excretion will take place if the pressure is not abnormal and will occasionally in a high pressure where there is unusual vitality or compensatory power. J. W. TRENKLE

SURGERY OF THE EYE AND EAR

EYE

Carreiras, B. A Modification of Elliot's Operation
(Una modificación en la operación de Elliot)
Rev de med y cirurg pract., Madrid 1916 21, 335

The author reviews the operation of Lagrange and Elliot the object of which is to form a subconjunctival fistula which produces a hypotensive effect on the eye. Various modifications have been proposed by different authors, but statistics, as well as the cases treated in Fuchs clinic, have demonstrated that the number of recurrences in cases where Elliot's operation was performed with peripheral iridectomy was twice as great as in cases performed with total iridectomy. In non iridectomized cases the percentage of recurrence is higher than in the totally iridectomized cases.

There are various complications which may occur during Elliot's operation the most commonly observed being injury to the ciliary body, loss of vitreous humor, hemorrhage in the anterior chamber and finally the small disk cut by the trephine may fall into the anterior chamber. The first two are due to posterior trepanation.

The fall of the cut disk into the anterior chamber is frequently reported. Komoto of Tokyo practices trepanation with the thermocautery in order to avoid it. This accident happened to the author in a case operated upon by him in 1913 and the procedure which he now advocates is for the purpose of avoiding it. He first scrapes and cleans the area in which the trepanation is to be made in order to remove remnants of submucous tissue. Then with a Bowman trephine, 2 mm. in diameter, he marks the site of the piece of disk to be removed by means of a slight pressure accompanied by two or three slight rotary movements. The trephine is removed and a corneal suturing needle with a specially fine thread is introduced inside the edge of the marked disk and passed diametrically across the corneal sclera of the disk so that the two ends of the thread issue from opposite points of the disk. The only further action is to pass the two thread ends upward through the central conduit of the trephine which can be done with a straight skin suture needle. The threads being held firmly in one hand the eye is perfectly immobile, and the other hand moves the trephine which cannot go beyond the required depth being guided by the thread the disk when cut immediately relaxing the pressure on the threads.

The advantages claimed are as follows:

1. Perfect immobility of the eye by means of the thread the tension of which can be graduated at will.

2. Impossibility of the trephine being displaced laterally and therefore of penetrating any other place than the place selected for the trepanation.

3. Exact knowledge of the moment when the trephine has penetrated as far as the anterior chamber because the thread yields at that moment and drags the disk away free.

The author has employed the procedure in cases in which Elliot's operation was indicated, and on account of the good results obtained he warmly recommends its adoption.

W. A. BRECKMAN

Gros, H. and Fromaget, H.: Two Cases of Expulsive Subchoroidal Hemorrhage in the Course of Cataract Operation; Attempt at Prophylactic Treatment (Deux cas d'hémorragies sous choroïdiennes expulsives au cours de l'opération de la cataracte: essai de traitement prophylactique)
Ann. d'ocul. 1916 ciii, 476

The author refers to two cases of expulsive subchoroidal hemorrhage in the course of cataract extraction. The first case was in a woman of 62 with double cataract. The left cataract which was complete was operated upon without incident and a satisfactory termination expected when the authors observed the edges of the wound open and a large vitreous globule of normal consistency appeared. There was no palpebral pressure, but the vitreous accumulated and there were violent ocular and orbital pains.

The vitreous was incised and a slightly compressive bandage applied. There was no bleeding. Forty-eight hours later on removing the bandage there was a violent hemorrhage and reappearance of the pains. The case terminated by atrophy of the globe the patient was lost sight of still having the second cataract.

The second case was in a man of 52 with complete double cataract. Operation was carried out on the right eye without incident but immediately afterward the patient experienced violent ocular pain. The upper lid distended and separated. An enormous vitreous mass escaped through the palpebral opening and the globe was soon emptied of its normal contents. The expelled vitreous was pure and there was no sign of blood. A slightly compressive bandage was applied. There was no external hemorrhage and the case ended in global atrophy.

In this second case, however the authors were enabled to deal with the cataract in the left eye. They proceeded in this case by making a preparatory hypotensive sclerectomy, reserving the crystalline extraction until two or three weeks later after the choroid had become accustomed to the well-established

lashed condition of tension. The sclerectomy was made by Ellis's trepan in the supero-external quadrant. From the eye thus prepared after three weeks the authors extracted the crystalline. The after-course was normal and the patient left the hospital with V.

The authors say that although there are few cases of haemorrhagic exophthalmos in the literature it is probably frequent. The fact that it tends to the loss of the eye does not encourage publication. Moreover, the absence of any curative treatment removes interest from consideration which is only interesting in account of its rarity.

In seeking for a cause of the haemorrhage the authors are of the opinion that it is clearly attributable to defective condition of the tissues and especially to an abnormal fragility of the vessels.

In the second case reported by the author the arteries were hard and rigid. The haemorrhagic condition of this patient had nothing to do with haemophilia, but was due to an arteriosclerosis condition. The operative act occasioned the rupture of the vessels in the neighborhood which were effected as well as the larger vessels of the vascular system. The authors think that the subchoroid haemorrhage was due to the poor condition of the ocular tissues.

W. A. BAKER

EAR

Dench, E. B. Aural Complications of Grippe.
N. Y. M. J. 9 6 4 80

The author emphasizes the fact that aural complications of influenza arise chiefly from the fact that the constitutional infection lowers the general bodily resistance.

The hemorrhagic type of inflammation, both in the middle ear and in the mastoid process, occurs more frequently as a complication of influenza than of other constitutional diseases.

Operative interference depends upon the otoscopic appearances and the local symptoms. If possible, conservative resolution does not take place early in division of the drum membrane is demanded and where tympanic drainage is not sufficient to relieve the pathological condition within the mastoid an early mastoid operation offers the best opportunity for conserving the function of the organ of hearing.

ELLEN J. PETERSON

Patton, W. T. Double Cavernous Sinus Thrombosis Following Obsolete Mastoiditis. *South M. J.* 9 6, 12, 3

The interesting points in the case reported by the author are

1. There was evidently considerable irritation of the meninges.

At no time was there an apparent involvement of the middle ear until after mastoidectomy.

3. The meningeal irritation cleared up after the mastoid was drained.

4. There was a sudden involvement of the left eye first with pus in the anterior chamber and later ophthalmos.

5. As was expected, there was involvement of the right eye making a typical picture of double cavernous sinus thrombosis.

OTTO M. RORT

Pont, A. Auricular Prosthetics (Prosthesi auricolare).
Atti del XI. Roma, 9 6 1 6 4

The surgical restoration of the pavilion of the ear when it is completely or almost completely lost seems to be almost impossible.

Prosthetic apparatus of rubber metal or ceramic have been constructed for such cases secured in place by partial retention appliances some of which were formed of gold wires covered with soft rubber and acting as a spring in the external auditory canal and by a steel wire resembling the frame of spectacles, which extended from the posterior face of the artificial ear to the top of the head bending over it in other cases the prosthetic apparatus was secured by screws or clamps passing through holes artificially made in the remaining pavilion stump or the apparatus was constructed in two parts not running into the other like a box in its cover and imprisoning the stump.

As these apparatus presented many difficulties, Pont resolved to use plastic paste which had already given him excellent results in nasal prosthetics, in cases of total or partial loss of the pavilion of the ear. He relates the particulars of two cases thus treated.

Partial or total prosthesis is accomplished by the same method. An impression of the auricular region is taken on the model made from this an artificial ear is made of wax from which a mould is constructed in two parts plastic paste is then poured into this mould in a melted state. After half an hour the ear is taken off the mould, and after being trimmed it is fitted in place with special glue.

If it is a total prosthesis the artificial ear must be provided with a large base which while covering the cicatrized tissues will also secure retention in the best way.

The mould is given to the patient so that he can change the prosthesis whenever necessary.

W. A. BRENNAN

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

MacLay O H : Chronic Ethmoiditis and Its Treatment. *Illinois M J* 19 6 xxx 342

Ethmoiditis may be classified as the chronic catarrhal inflammatory or hyperplastic type and the suppurative type.

The hyperplastic type is characterized by symptoms of chronic coryza, headache distressing in character at the base of the nose between the eyes and extending backward over the head, not influenced by stooping or jarring but influenced by fatigue, secretion clear and watery, loss of sense of smell, subjective unpleasant odor, granular pharyngitis and asthma.

In the suppurative type patients complain of headache extending to the neck and occiput, crusting and increased secretion in nose and nasopharynx, granular pharyngitis, hacking cough—with all symptoms much aggravated by cool, damp weather.

Diagnosis is made by a careful and exhaustive nasal examination together with the previous history. The examination is made under local anesthesia by careful inspection and if necessary irrigation of the maxillary antrum and fracture of the middle turbinate.

Treatment consists in exenteration of the ethmoid cells with careful after treatment.

ELLEN J PATERSON

Iglauer S : The Ohlke Method of Roentgenography of the Ethmoid and Sphenoid Cells. *J Am M Ass* 1916 lxvii, 1905

The technique advised is that of Rhese in which the patient lies on his side on the table with his face in contact with the photographic plate. The head is in contact with the plate at three points: the malar eminence, the outer edge of the supra-orbital margin, and the tip of the nose. The central rays go through the upper edge of the auricle and are thus directed obliquely through the head but vertically on the plate.

OTTO M ROTT

Skilern R H : Sphenoid Sinus; Present-day Value of Surgical Procedure. *J Am M Ass* 1916 lxvii 1896

The author reviews the subject under the following heads: (1) the indications for operation on the sphenoid sinus, (2) the various pathological conditions met with, (3) the individual methods and their values, (4) the possible accidents during operation, (5) the after treatment and (6) immediate and ultimate results.

He summarizes the present-day value of the sphenoid operation in the following words: "While

its curative value alone in sinus disease makes it invaluable to the rhinologist, the brilliant and dramatic results are those obtained when grave cerebral and orbital symptoms have supervened. Many cases of progressive blindness have been reported with recovery of vision. Many other ocular conditions as well as symptoms remote from the seat of infection have been cured by a timely radical operation on the sphenoid.

Sitting then in calm judgment on the merits and demerits of the endonasal sphenoid operation, one must necessarily come to the conclusion that on account of the almost uniformly brilliant results obtained and its comparative freedom from danger it must be classed as a procedure that no rhinologist of the present can afford not to master.

OTTO M ROTT

Hurd L M : Intranasal Surgery for Relief of Chronic Frontal Sinusitis. *J Am M Ass* 1916 lxvii 1816

All cases of chronic sinusitis in which there are no complications should be considered subjects for intranasal surgery. About 95 per cent of cases can be treated by this method. The contra indications are intracranial and orbital complications and fistula, all of which should be approached by the external route.

The first step in the technique is to enter the bullae ethmoidalis with a straight curette, breaking down its cells and then coming forward, obliterating the frontal and infundibular ethmoidal cells as far as the frontal process of the superior maxilla will allow. No attempt is made to entirely clean off the orbital wall with the curette; as puncture of this wall may lead to hemorrhage or infection of the orbit with resulting danger to the eye. At this point a larger opening will be found into the frontal sinus because some of the ethmoidal cell walls had formed part of the funnel-like floor of the frontal sinus about the ostium. The author then uses the angular curette and forceps of Greenwald to clean out the passage and to remove the remaining ethmoidal cells. With the angular curette the frontal sinus is entered.

For after treatment the author applies bismuth paste douches with aqueous solution and applies solution of silver nitrate and sodium chloride. The paste is injected daily until the discharge ceases when white petrolatum with a melting point at 90° F is injected to dilute the paste and the sinus is finally douched with normal saline solution at 115° F which removes the remaining paste and petrolatum.

In very obstinate cases, solutions of silver nitrate

can be used, increasing the strength from one to five per cent, first anesthetizing the sinus, then passing a cannula into the sinus for the silver solution and at the same time another larger cannula into the nose for the solution of sodium chloride and simultaneously filling the nasal cavity with salt solution and the sinus with silver solution, so that as the silver solution returns into the nose it is converted into silver chloride and has no further action on the mucosa.

OTTO M. ROTT

THROAT

Voorhees, I W Th F ucial Tonsils in Singers.
N Y M J 9 6 83

From an analysis of 5,000 tonsil operations in singers the author concludes that in the hands of skilled operators there need be no special fear of bad results, which are due to cicatricial contractions occurring from careless dissection that pain in the tonsillar region neck and larynx is probably due to section of some of the larger branches of the glossopharyngeal nerve and loss of singing voice which occurs rarely after tonsillectomy may be due to a nerve lesion, but more likely to adhesions and cicatrices in the fauces.

A singer should be operated upon by a laryngologist who has some knowledge of the art of singing and who can operate with great skill and carry out careful postoperative treatment.

ELLEN J PATTERSON

Lewis, P M Tonsillectomy Under Novocaine.
Med Rec 9 6 06

The author advocates the use of novocain in tonsil work only in adults of a phlegmatic temperament where the patient is given his choice of a local or general anesthetic.

The advantages of tonsillectomy under novocaine are that the patient sits in the upright position with the mouth open with ut mouth-gag or tongue depressor and can expectorate all blood the operation is painless if the tissues are properly anesthetized hemorrhage is insignificant both during and after operation and the patient can go home alone immediately after the operation.

The technique is as follows after anesthetizing the tonsillar tissues with a 4 per cent solution of cocaine, an application of a 1 per cent solution is made to allay the pharyngeal and faucal reflexes. A 1 per cent solution of novocaine with a few drops of adrenalin is then injected into the tonsil, the anterior and posterior pillars, and the edges of the tonsil. After the tonsillectomy one fourth to one

eighth grain of morphine is administered hypodermically to check the hyperactivity of the salivary glands and decrease the tendency to frequent attempts at deglutition with the idea of preventing hemorrhage.

ELLEN J PATTERSON

Marshall, W General Surgical Principles as Applied to Tonsillectomy *Laryngoscope* 916, xxv, 374.

The surgical principles mentioned are

1 No individual should be operated upon unless it is an emergency case, without a complete report being made of his complaint personal history and physical condition.

The parts adjacent should be at rest. This, however must never be secured at the expense of the patient's safety.

3 Good illumination and a thorough exposure of the field of operation are essential.

4 The integrity of the surrounding structures should be preserved.

5 All bleeding points should be promptly cared for and general surgical methods of handling bleeding areas adopted.

6 Operations should be done with dispatch, but never at the cost of thoroughness or safety.

OTTO M ROTT

Lack, H L An Improved Operation for Intrinsic Malignant Disease of the Larynx. *Lancet* Lond. 9 6 1912, 87

After making a curved horizontal incision across the larynx at the level of the cricothyroid membrane and freely exposing the upper edge of the cricoid ring and half of the thyroid cartilage, the author divides the thyroid cartilage in the median line from its lower edge nearly to the notch in its upper border with a small saw. Extending this incision backward at right angles just below the upper edge of the thyroid and then vertically near the posterior edge of the cartilage he marks out a square of cartilage, leaving intact both the posterior and upper borders of the thyroid. Removing this square of cartilage and arresting all hemorrhage, he opens the larynx in the median line through the cricothyroid membrane following the line of the first incision and extends the incision backward along the lower border of the cricothyroid membrane as close to the cricoid ring as possible, thus making a triangular flap through which the growth is removed from the larynx.

The advantages of this operation are that it is safer and more thorough than the ordinary thyrotomy.

ELLEN J PATTERSON

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EDITORIAL ANNOUNCEMENT

OUT of the mass of conflicting opinions regarding the advisability of operative intervention on the aural labyrinth in cases of infection secondary to suppurative otitis media some fairly definite views have come to be held by the surgeons working in this special department. There are still present however some sincere and well founded differences of opinion on the question as to when the labyrinth should be attacked surgically so that the collective review of the rather extensive literature pertaining to this subject which is to appear in the next issue of the INTERNATIONAL ABSTRACT OF SURGERY will be of interest to our readers.

This review is from the pen of DR OTTO M. ROTT of Chicago with whose work in the department of otology our readers are already familiar by reason of the numerous excellent abstracts which he has prepared. While his theme is limited to the field of otology Doctor Rott has brought to bear in its development the resources of a wide clinical experience in this special field and presents his subject with such lucidity and completeness as to make it of definite value to every reader desiring the last word on labyrinthine infection.

The author reviews first the various opinions expressed during the past ten years on the subject of labyrinthine infection secondly discusses the views of the several authorities on certain particular phases of the subject and lastly offers some definite conclusions as the logical outgrowth of his study.

INTERNATIONAL ABSTRACT OF SURGERY

MAY 1917

COLLECTIVE REVIEW

FUNCTIONAL TESTS OF THE LIVER AND KIDNEYS¹

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LIVER FUNCTION TESTS

IN order to study the functional activity of an organ it has been customary to apply certain specific tests to the individual functions of that organ. Thus if an organ has several functions tests are applied to one of these functions and conclusions are drawn therefrom as to the capability of the organ to perform all of its offices. This has been especially the case in the investigation of the condition of the liver.

The liver has a multiplicity of duties to perform in the body all of which are of essential importance. It is possible that each individual cell of the hepatic structure takes part in all of the liver functions it is also possible that different portions of the liver lobule and different conglomerations of the liver lobules may have specific functions. In the former case it is most likely that a reduction in the ability of the liver to perform one function will be accompanied by a proportional reduction in all the liver functions in the latter case one or more functions of the liver may be disturbed without affecting the other hepatic functions.

In order to appreciate the various methods for the determining of the liver functions it is best to enumerate the different functions of the liver

- 1 Secretion of bile
- 2 Relation to carbohydrate metabolism.
 - a. Glycogen formation
- 3 Relation to nitrogen metabolism
 - a Formation of urea.

4. Detoxification function

- a Formation of the conjugate sulphates and glucuronates.
- b Withholding of toxins and poisons.
- 5 The decomposition of the erythrocytes
- 6 The formation of fibrinogen.
- 7 The formation of antithrombin.

The methods for the study of the liver functions are several. These tests can be classified in the following way

1 A study of the carbohydrate tolerance of the liver this will include the tests of general carbohydrate metabolism, tests of tolerance of special carbohydrates for example Bauer's galactose test Strauss levulose test etc.

2 A study of the nitrogen excretion in the urine including the urea amino and ammonia nitrogen fractions

3 The urobilinogen excretion in the urine, which von Jaksch in 1892 considered significant of liver disease.

4. Analysis of the fibrinogen of the blood, which was found to disappear from the blood after liver extirpation (Doyon and Kareff Nolf, Corin and Ansaux, etc.)

5 A study of lipase and fibrinolytic ferments of the blood (Whipple Mason and Peigthal Goodpasture)

6 The phenoltetrachlorophthalcin test (Rown tree Hurwitz and Bloomfield Kahn and Johnston McLester and Franer)

Until recently tests of the functional capacity of liver in disease have been based exclusively on the well known physiological functions of the

¹Functional tests of the Stomach, Duodenum and Pancreas were discussed by Dr. Kahn in the April number of this journal.

liver, and attempts made quantitatively or qualitatively to determine its capacity along such lines. In this connection carbohydrate studies first occupied clinicians, physiologists and pathologists. The French school led by Roger Achard and Castaigne Baylac, Blerens de Haan championed the sugars as tests of liver function while the German school under the leadership of Quincke, Frerichs, von Noorden, Kraus and Ludwig Bloch and Mueller were unable to demonstrate any marked or constant reduction in sugar tolerance in cases of liver disease.

In a series of papers in 1898-1900 Strauss established the view that the discrepancies in the results of these various workers could be explained by differences in the particular carbohydrates employed together with the differences in the amounts of sugar administered. He followed his criticism of these carbohydrate studies by the introduction of his levulose test based on the work of Sachs which showed a constant decreased tolerance of levulose in liverless frogs. His test has come into rather widespread use. Strauss results as well as those of Ferrannini, Landsberg, Chajes, von Halasz, Hohlweg, von Frey, Churchman, Falk and Saxl, Bruening being tabulated in our recent paper. It appears that the test is far from satisfactory and that little reliance diagnostically or prognostically can be placed in its findings.

In 1906 Bauer introduced galactose as a test of liver function laying particular emphasis on its value in cases of catarrhal jaundice. This has been confirmed by Bondi and Konig, Reiss, and Jehn and Hirose. Falk and Saxl, von Frey and Hirose have demonstrated that the findings of the test are very inconstant in diseases of the liver other than catarrhal jaundice.

Before the International Congress of Medicine in 1913 Strauss reported a comparative study in which levulose and galactose were both employed—levulose 100 gm and galactose 30 gm.—in which he showed that the levulose gave a positive finding more than twice as often as the galactose. He advises the above doses for a comparative study. From his collective review of the literature it appears that in normal individuals 15 per cent of positive findings in congested livers 17 per cent, in cirrhosis 83 per cent, in icterus in early stages of liver 75 per cent, in obstructive jaundice 61.5 per cent, and in tumors 38 per cent positives have been obtained with his levulose test.

Bloomfield and Hurwitz, studying lactose tolerance in chloroform and phosphorus poisoned

dogs, feel that little value in relation to liver function can attach to studies of tolerance of any sugar.

Galactose. Bauer's galactose test is performed as follows: 30 grams of galactose as advised by Strauss are administered to the patient in the morning and the urine collected for the next five or six hours. The presence or absence of galactose in the urine is determined by Fehling's test.

Levulose. One hundred grams of levulose are administered in the morning and the urine voided during the following five or six hours tested by Fehling's and Selivanoff's tests for the presence or absence of levulose. Considerable difficulty was experienced with the performance of this test owing to nausea and vomiting following the consumption of such large amounts of sugar.

The phenoltetrachlorophthalein test. In 1909 Abel and Rowntree conducted pharmacological experiments on animals with phenoltetrachlorophthalein which was synthesized by Professor Orndorff of Cornell University. They found that this substance when injected intravenously was excreted in the bile. At the suggestion of Rowntree Whipple, Mason and Peigntal studied the excretion of this substance in the bile when the liver was subjected to artificial lesions. These authors found that in dogs which had been poisoned by phosphorus for example, the excretion of the phthalein was interfered with. It was then that Rowntree, Marshall and Chesney applied the tests clinically and obtained rather encouraging results.

The phenoltetrachlorophthalein test is applied in the following manner:

The dye is to be prepared for use each time. One gram of the substance is placed in a 200-ccm. Erlenmeyer flask, with 2 ccm. of 2/N sodium hydroxide solution and 18 ccm. of freshly distilled water. This is boiled for twenty minutes under a reflux condenser. The solution is filtered into a 200 ccm. flask, and is ready for use. This gives approximately a five per cent solution which is almost isotonic with blood. The solution is of an intense purplish color. It will keep only for a few days. Arbitrarily 8 ccm. of this solution approximately 400 mg. of the phthalein, has been selected. This amount is sufficient to give a most intense purplish red color to twenty liters of water. Its administration in health is never followed by the appearance of the dye in urine and this amount insures in health an intense color in the final preparation of the feces which is used for quantitative determination. The dye is administered intravenously by gravity with anti

septic and aseptic precautions and with the usual intravenous technique. The funnel and system are filled with freshly distilled water and after the flow is well established the phthalein solution is added. Fifty to 100 ccm. of water are used and the phthalein solution is washed in with freshly distilled water until the fluid entering the veins is colorless. Ten to fifteen minutes are required for its administration. Physiological salt solution may be preferable to distilled water for use in this injection.

Active purgation is instituted prior to the administration of the dye, and throughout the time of observation usually by means of compound cathartic pills. The stools are collected for forty-eight hours the urine for twenty-four hours. In the event of little or no feces being obtained, enemata are used, but unless a normal amount of dye is recovered the test must be discarded, since low findings under this condition could not be accepted.

The total forty-eight hour feces are placed in a two-liter bottle and diluted with water to one or 1.5 liter depending on their amount. This is placed in a shaking machine for from five to twenty minutes. Without allowing time for sedimentation one tenth of the total is placed in a one liter flask and to this is added 5 ccm. of 40 per cent sodium hydroxide, which causes the mixture to take on a very red color. Dilution is made with water to one liter. A stopper is inserted and the mixture thoroughly shaken. One hundred ccm. of this preparation is placed in a 200-ccm. flask, 5 ccm. of lead acetate added, resulting in a discoloration of the mixture and a throwing out of a heavy lead precipitate which carries down all the pigments leaving a clear colorless supernatant fluid. Five ccm. of 40 per cent sodium hydroxide are added thus again elicits the red phthalein color but does not redissolve the other lead pigment combination. In certain instances 5 ccm. of sodium hydroxide at this point are not sufficient to elicit the maximum intensity of red, and more should be added until maximum intensity is reached but not sufficient to free the other pigments from their insoluble lead combinations. The contents of the flask are made up to 200 ccm. shaken and a small part filtered off or the solution is allowed to stand for five minutes when in many cases a clear red, supernatant fluid ready for estimation can be decanted. This solution is compared in a Rowen and Geraghty modification of the Autenreith and Kouigsberger colorimeter with 20 mg. to a liter solution of the disodium salt of tetrachlorophthalein (e.g. 0.4 ccm. of the original solution

to one liter plus sufficient sodium hydroxide to insure maximum color). With these dilutions the amount of dye present is indicated directly in percentages.

When the amount recovered is below normal it is advisable to add 2 to 3 ccm. more alkali to the 200-ccm. preparation and redetermine thus insuring that the maximum color has been elicited. The addition of large quantities of alkalis is undesirable since it sets free the other pigments rendering the solution yellowish red instead of purplish red. Not more than ten minutes are required to carry out this test after the feces are removed from the shaker. Where difficulty is experienced on account of the quality of the color the following procedure may prove of some value in certain instances. After the addition of about 10 ccm. of 40 per cent sodium hydroxide the feces are made up with water to one liter. To one tenth of this is added 5 ccm. sodium hydroxide and water up to one liter. Of this 100 ccm. are placed in a 200-ccm. flask and to it are added 5 to 10 ccm. or more of calcium chloride mixture until the best quality of color is elicited. Dilution is made to 200 ccm. the mixture is allowed to stand from one-half to twenty-four hours and a small amount of the supernatant fluid is filtered off and read against the standard.

The author applied this test in a series of 34 cases. This series included patients who were suffering from liver disease as well as those who had no hepatic ailment. The test is not so easy to carry out as the description indicates. It is rather difficult and in many cases almost impossible to impress the nurse with the importance of collecting the entire quantity of feces. The duty is rather a disagreeable one and complaints are likely to arise. The chemical analysis is also a disagreeable procedure and in a number of instances almost discouraging. In these cases it is almost impossible to obtain a color which can be compared with the standard. In general this test is not easy. It requires some experience, and it needs a well-equipped laboratory.

The author concluded that this test is of very doubtful value. It certainly does not lend itself to clinical purposes. It is difficult of performance the manipulations are very disagreeable and the results obtained not conclusive.

A study of sulphoconjugation as influenced by liver disease (as practised by the author) The cause and the location of the formation of the ethereal sulphates and of indican has been studied by a number of investigators.

Since Staedeler found phenol in cow's and horse's urine Landolt, Lieben Hoppe-Seyler Bulginsky

and Munk found traces of it in normal human urine and Salkowski observed that in ileus and other obstructive intestinal disease the excretion of phenol in the urine is much increased.

This formation of phenol and phenolic substances cresol, indol skatol, etc. has been ascribed to the action of the intestinal bacterial flora. Such organisms as the bacillus coli communis which is a normal inhabitant of the intestinal canal are harmless under normal conditions. In conditions of injury to the intestinal mucosa these organisms become virulent (Fermi and Salto). Other organisms like the bacillus putrificus, bacillus aerogenes capsulatus which are obligatory anaerobes thrive in the colon where there is no oxygen (Herter) and break up protein into the carbocyclic toxic substances.

It was demonstrated by Baumann that these split products are very toxic but that when they are united with sulphuric acid they have lost their poisonous effect.

Baumann found that phenol sulphate is a normal urinary constituent and that the administration of phenol increases the phenol sulphate in the urine.

Baumann and Herter reported that not only phenol but also other substances were excreted in the urine as ethereal sulphates. They also observed that phenol unites not only with sulphuric acid but with other radicals. This was confirmed by Schmiedeberg who found that phenol unites with glycuronic acid.

Upon poisoning dogs with phenol, he found that the liver became rich in phenol sulphates. For example in 100 parts of liver he found 19 times as much tribrom phenol as in 100 parts of blood. This phenomenon seemed to prove that the liver is the seat of conjugation of the phenolic and indolic radicals with sulphuric acid.

Lang determined the quantity of ethereal sulphates in the urine of geese before and after extirpation of the liver. His figures are rather small and should not be taken conclusively but he was led to believe that the synthesis of the ethereal sulphates was not exclusively performed in the liver.

In experiments, performed *in vitro* Kochs also demonstrated, so it appeared to him, that the liver was not the only seat of sulphoconjugation. He took liver kidney pancreas, thymus and muscle minced each organ respectively, and added phenol and disodium sulphate. He kept these mixtures at body temperature or else at 8 to 12 C. All the tissues, save the thymus took part in the synthesis. He obtained similar results with ortho- meta and para-di-ox phenol.

Landi repeated the experiments of Kochs using only the liver tissue. But as he says due to the fact that decomposition sets in so very soon he could not confirm Kochs findings. In order to throw more light on the subject he made perfusion experiments with the liver and he came to the final conclusion that the seat of conjugation of the phenolic and sulphuric radicals was not the liver but the intestines.

The results of Landi are directly negated by the findings of Embden and Glaesner. They performed perfusion experiments on the organs of dogs, using the liver muscle kidneys, lungs and small intestines. From their investigations they conclude that the liver is the most important organ for the formation of the ethereal sulphates. Smaller quantities of ethereal sulphates are produced in the lungs and kidneys, but the muscle tissue and the small intestine play a very insignificant rôle in the formation of the ethereal sulphates.

Reale from his observations was of firm opinion that the liver was the seat of the synthesis of the ethereal sulphates.

Finizio confirmed Reale from his clinical findings. In normal individuals and in a case of echinococcus hepatic cyst he found that the administration of thymol caused an increased excretion of ethereal sulphates in the urine. When however he administered thymol to a patient suffering from hepatic cirrhosis, he found no increase of the ethereal sulphates in the urine.

In normal conditions of the alimentary tract, Strauss and Philpsohn found no phenol in the urine and they concluded that under normal conditions, the phenol and other radicals were conjugated with sulphuric acid. According to these authors the liver is the seat of the synthesis of the ethereal sulphates.

Heiter and Wakeman took 7 gm. of liver kidney muscle brain and blood respectively minced them and treated each tissue with 10 ccm. of a weak phenol solution, and allowed all to stand for two or three hours. The mixtures were then distilled, and they found that there was a loss in the phenol distilled over. The liver retained most of the phenol then came in order the kidneys, muscle, brain.

In conditions of jaundice Biernacki found four times as much ethereal sulphates as normally. Darrenberg and Petrov found an increased excretion of indol and skatol in jaundiced individuals. Labbe and Vitry obtained similar results. Magrangers obtained varying quantities of ethereal sulphates in icteric patients.

Amann found that in the healthy subject there is a direct proportion between the quantities of ethereal sulphates and the total nitrogen in the urine. The coefficient of Amann may be thus expressed

$$\frac{\text{Eth S} \times 100}{\text{N Urine}}$$

The value of this coefficient varies between 1.4 and 15. This was confirmed by Guerbet and Rouen. Slightly smaller coefficients were obtained by Magrangeas.

The question has been discussed by Elger and Hopadze whether the aromatic compounds formed in the system are diminished in amount and destroyed under normal conditions of hepatic activity and whether in cases of disturbance of the function of the liver these compounds are obviously increased and placed at the disposal of the liver for the conjugation with sulphuric acid. The subject is more important in its relation to disease of the hepatic parenchyma than to simply biliary stasis. The ethereal sulphuric acids are most frequently both absolutely and relatively increased in atrophic cirrhosis of the liver and most markedly in tumors of the liver.

In normal urine 14 to 25 per cent of the total sulphur is present as the so-called neutral sulphur. The easily oxidizable portion of this must arise from the sulphocyanate of the saliva, and from other partly unknown substances while the remainder is regarded—in part at least—as a derivative of the taurin of the bile (Lépine). This latter bears in the nomenclature of the French physiologists the name biliary sulphur of the urine.

Lépine found in incipient cases of obstructive jaundice in animals and in man the biliary sulphur absolutely and relatively increased as regards the oxidized sulphur (up to 30 to 43 per cent of the total sulphur). After a few days of the biliary obstruction the sulphur became approximately normal and after long continuance of the disturbance showed a decrease.

Regarding the fate of taurin and the origin of the neutral sulphur in the body, the with difficulty oxidizable neutral sulphur cannot yet be regarded as the amount of formed absorbed and decomposed taurocholic acid. For instance it has been shown that both components of the neutral sulphur vary within the widest limits in spite of feeding with the same amount of food and notwithstanding the same external relations of the animals used in the experiments so that the special relation of the with difficulty oxidizable

sulphur to taurin becomes rather doubtful (Benedict). Nevertheless attention must be called to the fact that the early increase and the later decrease of the neutral sulphur described by Lépine is very comparable to the view which we must take regarding the process of the formation of biliary acids in jaundice.

The following example selected from Lépine's work on cholelithiasis, illustrates the course of excretion of neutral sulphur in jaundice.

| | | |
|--------|-----------------------------|--------------------------------|
| May 2 | Light jaundice | |
| May 3 | Light jaundice | neutral sulphur = 31 per cent. |
| May 6 | Sudden increase of jaundice | |
| May 7 | Marked jaundice | neutral sulphur = 43 per cent. |
| May 10 | Marked jaundice | neutral sulphur = 20 per cent. |

F Mueller who studied a case of jaundice from gall-stones of somewhat long standing found in three days the values of the neutral sulphur to be 22.9, 15.7 and 10.7 per cent of the total sulphur. Later in the same case but with different diet the values were 19.2 and 17.4 per cent. In a case of carcinoma of the stomach and liver accompanied by jaundice the findings were 29.0, 21.1 and 16.1 per cent. These figures confirm Lépine's idea that the neutral sulphur diminishes the longer the jaundice continues.

On the other hand a marked decrease and even a lowering of the normal values should be expected in chronic obstructive jaundice provided the assumption is correct that in cases of disturbed outflow of bile into the intestines the production of biliary acids is markedly reduced by the interruption of the circulation of bile acids. Since this is not observed, the relation of the hardly oxidizable sulphur to taurocholic acid must be reinvestigated before an opinion on the formation of bile acids can be based on the excretion of neutral sulphur. Hence it does not follow that Schmidt should assume that the production of bile acids even in long continued jaundice suffers no reduction because he but rarely found high values for the neutral sulphur in his case of jaundice. According to Benedict a portion of the non-oxidized sulphur compounds which may be excreted in increased amounts as a result of toxic action on the protein constituents of the body are to be regarded as intermediary bodies which resist the further oxidation to sulphuric acid. Corresponding to their presence in the bile (Bial) conjugated glycuronic acids are regularly observed in the urine in cases of biliary obstruction (Van Leersum) (von Noorden's *Metabolism and Practical Medicine*)

The sulphoconjugation test has helped the author much in the determination of liver function. We shall discuss this in detail.

The toxic aromatic radicals produced by decomposition of protein are conjugated in the liver with sulphuric or glycuronic acid and are then excreted in the urine. If we should take indol as an example the following process would take place:

Tryptophane or beta indol-alpha-aminopropionic acid is one of the products of decomposition and putrefaction of proteins. It is the mother substance of indol and skatol etc. Upon breaking down of tryptophane indol which is very toxic, is produced.

If indol or indoxyl enters the general circulation marked toxæmia results with its concomitant symptoms. The protective mechanism of the body against this toxæmia is to conjugate the indoxyl with sulphuric acid in the liver producing a substance which is almost non toxic—indican.

Similar results are obtained with any of the aromatic radicals as phenol cresol truosin skatol etc.

It is well known that the total sulphur in the urine may be separated into three distinct fractions:

1. The inorganic sulphates.
2. The ethereal sulphates.
3. The neutral sulphur.

It has been definitely established that normally the inorganic sulphates form about 70 per cent of the total sulphur and the remaining 30 per cent are divided almost equally between the ethereal sulphates and the neutral sulphur.

The ethereal sulphates are the conjugated aromatic sulphuric acids. It is this fraction that is of special interest to us now.

It is of course impossible to rely upon the excretion of ethereal sulphates as a symptom of hepatic function. The proteins which are ingested daily give rise to their quota of aromatic radicals which influence the quantity of the conjugated sulphates. The condition of the intestinal flora plays a rôle in the formation of aromatic radicals, thus it is known that in intestinal putrefaction there is a marked increase in the conjugated sulphates excreted.

The author therefore, adopted the following technique for the determination of liver function by means of the ethereal sulphate output.

The patient received a dose of castor oil to clean out his bowels. He was then kept on a known diet for two days, during which time the urine was collected, preserved and analyzed for

total sulphur and ethereal sulphates.¹ On the third day the patient received a capsule containing one half gram of thymol. The urine was collected for the next two days, preserved and analyzed for total sulphur and ethereal sulphates.

If all the thymol were absorbed and if all the thymol were conjugated with sulphuric acid and none with glycuronic acid the 0.5 gram of thymol would be excreted as 0.7666 gm. of thymol sulphuric acid. This would cause a marked increase in the percentage of ethereal sulphates. If the liver were not functioning properly the thymol would not be conjugated and the percentage of ethereal sulphates would be only slightly different from what it had been on the first two days (Table VII).

One objection to the study of the function of any organ as an index of disease of that organ is, that it is perhaps possible for the healthy part of the diseased organ to compensate and assume the work of the whole gland. In such a condition of course the functional output of the organ may be normal and would be no index of the pathological anatomy of the organ. Under these circumstances only marked obstructive changes would leave their impress on the functional activity of the organ.

TABLE VII
ETHEREAL SULPHATE ELIMINATION BEFORE AND AFTER THYMOL

| Case No. | Diagnosis | Total sulphur, gm. | | Ethereal sulphate, gm. | | Ethereal sulphate, per cent of total sulphate | |
|----------|----------------------|--------------------|--------------|------------------------|--------------|---|--------------|
| | | Before Thymol | After Thymol | Before Thymol | After Thymol | Before Thymol | After Thymol |
| 1 | Normal | 0.148 | 0.10 | 0.050 | 0.048 | 34.0 | 48.0 |
| 2 | Colic | 0.07 | 0.07 | 0.037 | 0.030 | 53.0 | 43.0 |
| 3 | Fracture | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 4 | Conjugation of liver | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 5 | Conjugation of liver | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 6 | Gall stones | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 7 | Gall stones | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 8 | Cholecystitis | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 9 | Atrophic cirrhosis | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 10 | Tumour of liver | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 11 | Cancer of liver | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |
| 12 | Hyphema of liver | 0.051 | 0.051 | 0.021 | 0.021 | 41.0 | 41.0 |

It has been the author's experience however that disturbances in the structure of the liver go hand in hand with disturbances of function especially as is indicated by sulphuric acid conjugation of the aromatic radicals. The author has found that in cirrhosis of the liver the conjugation of thymol with sulphuric acid does not take place to as marked an extent as in the

¹The total sulphur was analyzed by Benedict method, the ethereal sulphates by Fieser's method.

normal state. This question is now being more fully investigated and in the very near future the author hopes to make a more extensive report. Meanwhile he has cited a few cases above.

It will be observed that in the non hepatic diseases and in the non-destructive diseases of the liver a marked increase in the excretion of ethereal sulphates was observed on the day after the thymol administration. In diseases of the liver such as atrophic cirrhosis, cancer of the liver or syphilis of the liver this organ has lost its power to conjugate the thymol with sulphuric acid. Case 10 was a benign tumor of the liver and it seems no destructive changes went on in the hepatic tissue.

Rowntree, Marshall and Chesney from their thorough investigation of all the liver function tests came to the following conclusions:

1. Outspoken changes in liver function can be demonstrated in most cases of advanced liver cirrhosis in markedly congested livers associated with myocardial insufficiency in carcinoma of the liver in luetic livers and in conditions of cachexia with marked anemia.

2. Functional changes have been most marked in cirrhosis in neoplasm of the liver and in cachectic conditions with severe grades of anemia. The functional changes in chronic passive congestion have been not frequent or pronounced.

3. Harmony in the findings of the tests is present in some cases, i.e. most of the tests indicating a decreased function or indicating a normal function but in other instances the function in an individual case appears normal by some tests and diminished by others and absolutely no parallelism exists between the findings of the various tests in the latter instance, i.e. with one test indicating decrease in function it is impossible to predict what the other tests will show.

4. From this small series of cases it is impossible to reach definite conclusions concerning the absolute and relative value and limitations of these various tests but the following impressions are the outcome of our limited experience.

1. Under clinical conditions a phthalein output under 30 per cent or the appearance of phthalein in the urine is of unquestionable significance. When in accord, i.e. both positive or both negative the evidence is of more value than single or discordant findings. Positive value is not claimed for negative findings. A marked decrease in phthalein means a decided injury to liver function. Autopsies in 11 cases have increased our belief in the value of this test.

2. Low fibrinogen values are frequently but inconstantly encountered in cirrhosis which confirms the results reported by Whipple. Marked positive findings may carry prognostic significance although they may not appear until shortly before death. Negative findings have no value.

3. The determination of the lipolytic activity of the blood plasma furnishes very little or no information of prognostic or diagnostic significance in these types of clinical cases. In two or three instances only have the clinical findings been comparable with our findings or those of Whipple in chloroform or phosphorus poisoning. High values probably carry prognostic significance.

4. Goodpasture's fibrinolytic ferment studies on this series of cases show that this ferment is present only in cirrhosis and hence when present is of definite diagnostic importance.

5. Bauer's galactose test is applicable without discomfort to the patient but yields no information of consequence.

6. Strauss' levulose test was attended with technical difficulties—nausea and vomiting frequently following its employment and yielded information of no consequence in the limited number of cases in which it was successfully carried out.

7. Blood nitrogen partition. Cumulative phenomena have not been encountered in this series except with coexistent renal disease.

The urea nitrogen percentage of the total has been 40 per cent or less in several instances and especially low in cases of advanced cirrhosis.

The amino-acid nitrogen has been high in a considerable proportion of the clinical cases. In phosphorus poisoning the amino-acid nitrogen increase was always present and was associated with increase in the urea nitrogen and total non-proteid nitrogen. In chloroform poisoning the absolute and relative values of the various forms of nitrogen did not vary from normal.

8. Urinary nitrogen partition. No instance of absolute normal urinary nitrogen partition has been encountered. However the low level of protein metabolism so often present together with the non-exclusion of acidosis render the interpretation of the nitrogen distribution somewhat difficult. Practically all the cirrhosis cases showed definite nitrogen partition changes.

The ammonia nitrogen and amino-acid nitrogen were definitely increased in most of the cases studied and particularly in cirrhosis.

Concerning the relative merits of these tests it appears that the phthalein, the fibrinogen, the

blood and urine nitrogen partitions are of decided value in determining the presence and to a less degree the extent of functional involvement, while the demonstration of the presence of fibrinolytic ferment is of decided diagnostic importance. The determination of sugar tolerance and of the lipolytic activity of the blood apparently afford information of much less value.

In my experience as I have stated above the phthalein test is of no value therein I cannot confirm the findings of Rowntree, Marshall and Chesney.

Falk and Saxl studied the various liver function tests. For purposes of study they have divided affections of the liver into four groups. Group I includes tumors of the liver such as cancer, sarcoma, echinococcus, amyloid liver, leukemia, and chronic passive congestion. The parenchyma is affected secondarily. In Group II they place all infection and intoxications (typhoid, pneumonia, tuberculosis, chloroform, alcohol, phosphorus, for example). Group III contains those conditions in which the liver may be pathologically affected by the escape of bile from its normal passages (icterus from gall stones, from complete closure of the common duct, and from catarrhal conditions). In Group IV are placed the atrophic and hypertrophic cirrhoses of the liver. A functional tests Falk and Saxl employed only those of known value, i.e. levulose, urobilin, and the nitrogenous bodies—amino-acids, poly-peptides, ammonia. Each of these tests was applied to their cases. The analysis of their results and of those reported in the literature shows that a marked disturbance of liver function is disclosed particularly in cirrhosis of the liver. Nitrogen ratios, urobilin excretion, and tolerance of levulose all reveal abnormalities. Such constancy of findings is seen in no other hepatic disease. In Falk and Saxl's cases these disturbances of function appeared early in the course of the disease. Often it was possible by finding urobilinuria, levulosuria, and especially nitrogenous ratios, to arrive at the correct diagnosis at a stage of the affection when only vague gastric symptoms were present. In the remaining three groups the findings were less useful in a diagnostic way.

Hereditary levulosuria. Hohlweg, who several years ago was among the first to extol levulose as a functional test, contributes a second article which is no less favorable in tone. He believes that the degree of liver injury may be suspected from the amounts of levulose assimilated. Thus the more extensive the disease the less levulose will be utilized. As a test for levulose he relies on the Belliwanff test.

In cases of stone in the common duct with icterus provided the obstruction was complete, alimentary levulosuria appeared even after 50 grams of levulose. In one case four weeks after the calculus was removed there was lowered sugar tolerance indicating some severe degree of liver injury in such cases of stone. He expresses the belief that obscure cases of colic about which the patient seeks advice may be differentiated as far as diagnosing hepatic colic on the one hand, from gastric and intestinal crises and renal colic on the other.

Stones in the gall bladder or cystic duct have no effect on the levulose tolerance. In tumors of the liver there is no decrease or but very little even when there is complete obstruction of the common duct. This difference between stone and carcinoma in their effect on the sugar tolerance is believed to be due to the fact that when a calculus blocks the duct the obstruction is an acute one while in cancer the blocking is gradual and the liver has time to accommodate itself to the altered conditions. Goodman has always felt that in cases of carcinoma of the liver the liver function as far as the levulose is concerned is little affected because the cancer-cells seem to be able to a certain extent the function of the original liver tissue.

In cirrhosis the results were confusing as some cases assimilated large amounts of sugar and some small amounts and this difference was noted even in individual patients. With improvement there is an increased tolerance. In enlargement occurring in the course of leukemia, anemias, echinococcus disease and congestion the tolerance is not much affected. These observations of Hohlweg were conducted on 100 patients, and they led him to have faith in the method as a good clinical index of changes in liver tissue.

Araki working in Japan has found that the normal tolerance is only 50 grams a fact at variance with other observers notably Hofmeister who was the first to work out the tolerance of various sugars. Can it be that the Japanese react differently to carbohydrates than do we of the Western World. Although Araki's work has not the weight which accrues only from a large series of cases yet his results are in the main those of his predecessors with this difference that he recommends 50 or 30 grams never 100. He prefers as a test for levulose the Nylander reagent.

With the knowledge that in diabetes sugar appears in the urine because of its increased concentration in the blood, it is of supreme interest to know that in these cases of alimentary

levulosuria there is a temporary flooding of the blood with levulose an alimentary levulosemia, or as Schirokauer puts it alimentary levulose hyperglycemia.

After 100 grams of levulose normal individuals show a blood-content of 0.1 per cent 0.17 per cent without a corresponding levulosuria. An analogy has already been found in the production of a hyperglycemia after glucose but without glycosuria. In cases of hepatic disease levulosemia was always seen but there was not a constant parallel between the amounts in the blood and the amounts in the urine. Schirokauer believes there is a renal factor which is not generally taken into consideration even when the organ is healthy and when the kidney is diseased the effect is even more noticeable. It would be of the utmost value to have parallel studies made between the amount of levulose (or galactose) in the blood and urine on the other hand and reliable renal functional tests on the other.

Alimentary galactosuria Wörner and Reiss have not tested content with qualitative tests either for galactose or levulose but believe quantitative tests of both are alone of value. After 40 grams of galactose urinary amounts of 3 grams or above are considered pathological and after 100 grams of levulose the excretion must exceed 0.7 gram before one can say there is a diminished tolerance of levulose. The authors were hopeful that by a combination of both methods they might find a test useful in differentiating the various diseases of the liver but their work has failed to realize this ambition. They did find however that galactose is excreted constantly in only a certain variety of hepatic disorders: catarrhal icterus phosphorus poisoning fatty liver while in other diseases—cirrhosis and syphilis—the reactions were variable and in mechanical obstruction of the common duct—carcinoma gall-stones—the test was negative. Alimentary levulosuria on the other hand is present in liver injury *sui generis* irrespective of the lesion.

Tests made with dextrose levulose and galactose by Wagner indicate that dextrosuria is valueless as a functional test. Levulosuria is of value but is far inferior to galactose. Wagner takes exception to Strauss' view quoted above and says that levulose has a decided disadvantage inasmuch as there are often gastrointestinal upsets following its use particularly in cases of cirrhosis. Wagner hints at future work showing that a combination of galactose with beef extract (Liebig) makes the test more sensitive than when galactose is given alone.

Hartleben believes a positive test depends a good deal on the presence of icterus as all cases with icterus have a diminished tolerance. It is questioned whether with icterus there is not a general degeneration of the liver. However severe cases of hepatic cirrhosis fail to give the test so that this explanation is not all sufficing.

Maliwa in one case of severe icterus found only the physiologic amounts of galactose after administering the usual quantity (40 grams). He suggests that the kidneys play an important rôle together with the liver. The latter is responsible for the concentration of galactose in the blood and when diseased there is an increased amount too much for the kidneys to hold back. If the liver is healthy and the kidneys are diseased the concentration although normal is too great for the diseased kidneys and galactose appears in the urine. In other words alimentary galactosuria can in no sense be considered as an unequivocal sign of hepatic disease.

An attempt has been made by Hertz and Brokman to make use of the Aberdalden method for the diagnosis of hepatic disease. This attempt cannot be said to have resulted very favorably and seems to promise but little.

Roger Chiray, Gautier and others have studied the excretion of glycuronic acid in the urine as a sign that the liver is doing its work properly. Gautier found that in one hundred healthy persons examined the glycuronic acid content was pronounced and a dose of camphor was followed by little if any increase in the glycuronuria on an average diet. The fasting healthy subject showed a slight increase after the camphor test. In cases of heart or kidney disease with insufficiency of the liver there was always a notable transient elimination of glycuronic acid after ingestion of the test dose of camphor. In fifteen diabetics the camphor test always proved negative. In advanced cirrhosis the liver is unable to respond to the camphor test. Roger believes that the glycuronic acid is manufactured by the liver to combine with certain toxic bodies in the organism and thus eliminate them. This assumption is confirmed by a recent case of attempted suicide with a preparation of phenol. The urine was black and showed the highest proportion of glycuronic acid. Gautier has ever encountered. Then followed a phase in which there was no glycuronuria after which normal conditions were gradually restored. With cirrhosis of the liver the total absence of glycuronuria is a sign of a speedily fatal outcome. In tests of alimentary glycosuria the glycuronuria was not modified even by ingestion of 150 gm. sugar.

confirming the view that the glycuronic acid is produced only when needed to take care of toxic substances and get them eliminated. The Grunbert and Bernier test for glycuronic acid is reliable if the reagents are pure.

Von Moraczewski and Herzfeld have studied the excretion of certain urinary constituents in hepatic disease. Examination of healthy persons as well as 4 cases of cirrhosis of the liver cases of catarrhal jaundice one of diabetes one of pernicious anemia one of leukemic tumor of the liver and spleen one of acid intoxication and 2 of chronic renal disease showed that in general there ensues a certain form of excretion in hepatic diseases which resembles the excretory conditions while fasting. There is a high degree of uric acid ammonia and acetone excretion. Large amounts of volatile fatty acids and indican are always found in the urine. The acetone increase is especially noticeable when on a milk regimen. The increase of certain urinary constituents runs parallel with a decrease of others. Nitrogen for instance is markedly decreased. In pernicious anemia and leukemia uric acid is augmented this however 1. not the case with ammonia acetone and indican. In diabetes acetone and ammonia are increased uric acid and the volatile fatty acids are not increased. In acid intoxication the volatile fatty acids ammonia and acetone are increased while the excretion of uric acid remains about normal. In nephritis nothing of import was noted in the excretion of the urinary constituents. Hence in diseases of the liver all aforementioned substances were increased while in infection of the blood but a few of these substances were excreted in larger amounts.

It is the author's experience that no single test is of great aid in exact diagnosis of liver disease. A combination of several tests may prove helpful occasionally.

KIDNEY FUNCTION TESTS

Goodman and Krusteller sum up in the following words the purpose of renal function tests.

When we take into consideration that the exact phenomenon involved and the process of excretion by the kidneys is still a matter of more or less speculation an attempt to establish an index of their work is accompanied with difficulties. A routine chemical microscopical and bacteriological examination of the urine usually reveals the presence of disease of the kidney. The X-ray may reveal changes in its contour or the presence of calculi. With the cystoscope and ureteral catheters we may be able to estab-

lish the presence of disease in one or both kidneys. These methods, however afford no definite information as to the extent of the pathological process under consideration nor the functioning capacity of the kidney. To the surgeon confronted with the necessity of operating particularly where the removal of a kidney may become necessary it is a question of first importance whether the other kidney present is capable of sustaining life.

The tests that we shall especially review here are the phenolsulphonophthalein test and the presence in the blood and urine of certain products of nitrogenous metabolism.

The method of chromocystoscopy that is to say the administration by mouth, or preferably subcutaneously of coloring matters such as are readily excreted by the kidneys is of greater or less practical value. It serves at least in localizing the ureteral orifices.

Methylene blue was introduced for this purpose by Archard and Castaigne. The drug is given by mouth in one-quarter grain doses or preferably fifteen minims of a 5 per cent solution is administered by hypodermic injection. In health the drug will dye the urine in about one-half hour while in the presence of disease of the kidneys this is delayed. Methylene blue is of little value, however in estimating the functioning capacity of the kidney because it is slowly eliminated, and therefore requires observation for a long period of time. It has been estimated that only about 50 per cent of the drug is excreted normally in the urine. It does not lend itself moreover to accurate colorimetric estimation.

Indigo-carmin was first used by Haidenheim in his investigation of the physiology of the kidney who showed that this drug was excreted by the epithelial cells of the convoluted tubules. Vaelcher and Joseph assistants of Czerny of Heidelberg proposed the use of this dye for the purpose of testing the renal function. After an intramuscular injection of 20 ccm. of a 4 to 10 per cent solution the drug should appear in the urine of a healthy individual in less than one-half an hour and is delayed in the presence of disease. The delay of its appearance and the diminished intensity of the color of the stream ejaculated from the ureters as revealed by the cystoscope, is supposed to afford an estimation of the relative amount of destruction of the secreting epithelium of the convoluted tubules. This dye has the advantage of being more readily eliminated than methylene blue but has the decided disadvantage of being decolorized by purulent alkaline urine. It does not lend itself to colorimetric estimation,

and only about 25 per cent is eliminated by the kidneys

Rosaniline (rosaniline trisulphate of soda) first introduced by Lapine has not attained any popularity. One ccm. of a one per cent solution injected subcutaneously usually makes its appearance in less than one half hour. From 65 to 95 per cent is recovered in twenty four hours.

The phenolsulphonephthalein test Phenolsulphonephthalein which was first described by Remsen is a bright red crystalline powder somewhat soluble in water and alcohol readily soluble in the presence of alkalis. The drug as determined by Abel and Rowntree is non-irritant locally and is excreted practically entirely by the kidneys and with extraordinary rapidity appearing in the urine normally within a few minutes of injection. In alkaline solution it presents a brilliant red color which is ideally adapted for quantitative colorimetric estimation.

This drug has been utilized by Rowntree and Geraghty to determine the functional capacity of the kidney in disease. By means of the test which they have introduced it is possible to determine accurately the condition of the kidneys, whether they are diseased and in case they are to determine the extent. This test permits one to determine whether the kidney disease if chronic will likely prove rapidly fatal whether uræmia is apt to develop or if any given case is suitable for surgical interference from the renal point of view. The technique of the test is as follows:

Twenty minutes to half an hour before administering the test the patient is given 200 to 400 ccm. of water in order to insure free urinary secretion otherwise the delayed time of appearance may be due to lack of secretion.

Under aseptic precautions a catheter is introduced into the bladder and the bladder completely emptied or the patient is allowed to voluntarily do so. Noting the time 2 ccm. of a carefully prepared solution of phenolsulphonephthalein containing 6 mg. to the ccm. is accurately administered subcutaneously intramuscularly or intravenously by means of an accurately graduated syringe.

The urine is allowed to drain into a test tube in which has been placed a drop of 25 per cent sodium hydroxide solution and the time of the appearance of the first faint pinkish tinge is noted.

In patients without urinary obstruction the catheter is withdrawn at the time of the appearance of the drug in the urine and the patient is instructed to void into a receptacle at the end

of one hour and into a second receptacle at the end of the second hour.

A rough estimate of the time of appearance can be made by having the patient void urine at frequent intervals without the use of the catheter. In prostatic cases it is wise to have the catheter in place until the end of the observation. The catheter is corked at the time of the appearance of the drug in the urine and the cork removed at the end of the first hour and at the end of the second hour the bladder being thoroughly drained each time. On many of the patients of this type on whom our observations have been made a retention catheter has been in use as a part of the routine treatment on account of the residual urine. When a catheter is to be employed it is well previously to have the patient under the influence of hexamethylenamine.

Each sample of urine is measured and the specific gravity taken. Sufficient sodium hydroxide 25 per cent is added to make the urine decidedly alkaline in order to elicit the maximum color. The color displayed in the acid urine is yellow or orange and this immediately gives place to a brilliant purple red color when the solution becomes alkaline. This solution is now placed in a liter measuring flask and distilled water added to make accurately 1 liter. The solution is then thoroughly mixed and a small filtered portion taken to compare with the standard, which is used for all of these estimations.

When the Duboscq colorimeter is used the standard solution used for comparison consists of 3 mg. of phenolsulphonephthalein (or 0.5 ccm. of the solution used for injection) diluted to 1 liter and made alkaline by the addition of only one or two drops of 25 per cent NaOH solution. This is a beautiful purplish red solution retaining its intensity of color for weeks or for an indefinite period. The one solution therefore serves for an immense number of tests.

Goodman sums up his study of the phenolsulphonephthalein test in the following words:

1 In clinical influenza the small output of phenolsulphonephthalein is out of line with the findings in other general diseases and a search for the reasons for this offer an opportunity for an interesting study which we (the hospital staff and myself) hope to pursue in the near future.

2 The general series of diseases show a good output of phenolsulphonephthalein as a rule when there is clinically no evidence of kidney involvement.

3 The findings in regard to the value of this test both from a diagnostic and prognostic stand

point in nephritis confirm former conclusions in this respect and also the statement of Rowntree and Geraghty that it reveals the degree of functional derangement, whether the nephritis be acute or chronic.

4. In several of Goodman's cases this test has revealed a degree of renal insufficiency of which the clinical condition of the patient gave no evidence but the existence of which has been confirmed by the fatal outcome of the case.

5. The test has served to demonstrate renal insufficiency in instances in which operation was contemplated and in which, though chemical and microscopic examinations were negative, subsequent developments confirmed the existence of the renal insufficiency.

6. In cases of ureteral or renal obstruction Goodman's findings are again in line with those of Rowntree and Geraghty in that Goodman found a marked improvement, as indicated by the phenolsulphonphthalein test following the removal of the obstruction.

7. In unilateral and bilateral disease of the kidney the test has revealed the functional capacity of each kidney and to such a satisfactory degree that in some instances, it has assisted Goodman to determine on the course of operative procedure. An absence of a very small output of the dye from one kidney with an increased output from the other side indicates a seriously diseased kidney on the one side with a compensatory hypertrophy of the other kidney.

Tracy employed the test in about 300 cases the material for this paper being based upon the observations of the first 100 cases. He says that it does not seem possible to work out the minimum percentage phthalein output which will be safe to undertake surgical operations nor is it safe from the phthalein test to determine what cases should or should not be subjected to operation. He believes it will never be possible to determine this point from the phthalein test as the functional activity of a kidney varies under numerous circumstances and at different times. In determining whether or not a patient should be subjected to operation the history, clinical symptoms and physical examination are of much greater value than any renal functional test ever devised. The phthalein test used in conjunction with the clinical symptoms, history and physical examination is of value. A small percentage output should put the surgeon on his guard and cause him to study the patient most carefully before undertaking an operation. The phthalein test should be used only as one of the many methods

of investigation in ascertaining the condition of the patient.

Thayer and Snowden have compared the results of the phenolsulphonphthalein test with the necropsy findings. They found that in severe chronic nephritis there is always a low phthalein output. This rule seems to have no exception, in their experience. The output of phthalein in cases of chronic nephritis diminishes steadily until the terminal uremia when it approaches zero. They found a marked reduction of phthalein output in the cloudy swelling of kidneys accompanying acute infectious diseases.

Goodman and Kristeller summarize the following advantages of this test:

1. The drug does not readily decompose in solution and can be sterilized by boiling.

2. The dose required is small, one ccm. of solution containing 0.006 gm. of the dye.

3. The injection is painless and is not followed by irritation if the solution is sufficiently alkaline.

4. The drug is excreted entirely by the kidneys.

5. The drug can be demonstrated in the urine in from three to ten minutes after the subcutaneous injection.

6. From 50 to 70 per cent is excreted during the first two hours.

The drug lends itself to accurate colorimetric measurement.

8. The quantity of drug recovered in a specimen within a given time is not influenced by the volume of urine.

9. The presence of pus, phosphates, bile and indican does not interfere with the colorimetric estimation of this drug.

RENAL FUNCTION AS MEASURED BY THE ELIMINATION OF FLUIDS, SALT AND NITROGEN AND THE SPECIFIC GRAVITY OF THE URINE

Hedinger and Schlaver have recently proposed a qualitative test of the mode of urinary function as measured by specific gravity, salt and water excretion in two-hour periods. These authors show how the urinary response to a full dietary containing a reasonable amount of fluids, salt and purins varies in health and disease. They find that the normal and the nephritic individual differ very markedly from one another in the result obtained with the so-called nephritic test meal. Not only can the absence or presence of renal function be determined but likewise its intensity.

Mosenthal records the results of studies carried

out along lines suggested by this work. The test meal has been simplified somewhat and it appears that the entire procedure or a part of it, may very well become a valuable routine test for the general practitioner.

He carried out this test in more than one hundred cases. The only patients not investigated in whom it was necessary that renal function should be ascertained were those suffering from the acute nephritides of these such as have been treated in the wards of the hospital during the past winter have been too sick to take food in any quantity or have been so unmanageable as to preclude the proper collection of specimens. It has been ascertained that the nephritic test meal, when duplicated on the same patient yields identical results provided the clinical condition has not changed. In several instances triplicate and quadruplicate observations have been made.

The directions for the nephritic test meal are contained in the following memoranda given to the nurse in charge of the case in mimeographed form (Mosesenthal).

For _____ Date _____
All food is to be salt free food from the diet kitchen.
Salt for each meal will be furnished in weighed amounts.
All food or fluid not taken must be weighed or measured after meals and charted in the spaces below.
Allow no food or fluid if any kind except at meal times.
Note any misapprehensions or irregularities that occur in giving the diet or collecting the specimens.

Breakfast 8 a.m.

Bolled oatmeal 100 gm
Sugar $\frac{1}{2}$ teaspoonful
Milk 30 ccm.
Two slices bread (30 gm. each)
Butter 20 gm.
Coffee 100 ccm.
Sugar 1 teaspoonful } 200 ccm.
Milk 40 ccm.
Milk 200 ccm.
Water 200 ccm.

Dinner 2 noon

Meat soup 150 ccm
Beefsteak 100 gm
Potato (baked, mashed or boiled) 150 gm
(green vegetables as desired)
Two slices bread (30 gm. each)
Butter 20 gm.
Tea 150 ccm.
Sugar 1 teaspoonful }
Milk 20 ccm.
Water 250 ccm.
Pudding (apple or rice) 110 gm.

Supper 5 p.m.

Two eggs, cooked in any style
Two slices bread (30 gm. each)
Butter 20 gm.
Tea 150 ccm.
Sugar 1 teaspoonful—200 ccm.
Milk 20 ccm.
Fruit (steamed or fresh) portion
Water 300 ccm.

8 a.m.—No food or fluid is to be given during the night or until 8 o'clock the next morning (after voiding) when the regular diet is resumed.

The patient is to empty bladder at 8 a.m. and at the end of each period as indicated below. The specimens are to be collected for the following periods in properly labeled bottles.

8 a.m.—10 a.m. 10 a.m.—1 p.m. 1 p.m.—2 p.m. 2 p.m.—4 p.m. 4 p.m.—6 p.m. 6 p.m.—8 p.m. 8 p.m.—8 a.m.

Specimens are to be left in the ward until called for at 8.30 a.m. by the attendant from the chemical laboratory.

The above dietary contains approximately 13.4 gm. of nitrogen 8.5 gm. of salt 1760 ccm. of fluid and a considerable quantity of purin material in meat soup tea and coffee. All these substances act as diuretics and it is on the mode of excretory response to such stimuli that the present study of renal function depends. Spaces are provided to chart the amounts of food not eaten by the patient and corresponding allowances can be made in calculating the food intake. It is in no way essential that all the meals should be taken in their entirety nor that the food should be exactly as indicated. The bill of fare here presented has been designed to adapt itself to the daily food supply furnished by the hospital. In private practice it would only be necessary to ask the patient to eat three full meals a day and write down the approximate quantities as—1 cup of coffee 2 slices of toast 2 tablespoonfuls oatmeal etc. in order to be certain that the diet for the day contained a sufficient quantity of the diuretic materials of our ordinary food to make an adequate demand on the kidneys to test renal function. It is extremely desirable to insist on the fact that since the food as found in most households suffices to carry out these tests and the procedure is not a complicated one it need not be confined to hospitals and patients who can afford private nurses.

A wide variation may be permitted in the above-mentioned directions. Certain others however must be followed slavishly in order to make the outcome of the test yield its maximum result. The urine must be collected punctually every two hours. No solid food or fluid of any kind must be taken between meals and especial care must be observed that nothing of any kind is eaten or drunk during the night and that the night specimen is completed before breakfast is touched. The reason for this is that the normal kidney responds rapidly to fluids ingested so that within a few hours a marked diuresis occurs. The following observation may serve as an illustration of this previously well established fact.

| Time Interval | Urine Volume | Fluid Ingested |
|----------------|--------------|-------------------|
| 6 p.m. 8 p.m. | 84 | 7.30 p.m. supper |
| 8 p.m. 10 p.m. | 590 | 1000 ccm of water |
| 10 p.m. 8 a.m. | 36 | |

In this instance within two and one-half hours of drinking 1000 ccm of water over 500 ccm. were eliminated while during the eight hour period following the diuresis only 361 ccm of urine were voided.

Mosenthal makes the following summary of his findings

The nephritic test meal as suggested by Hedinger and Schlaver and elaborated by him has not only proved itself to be an admirable test for renal function but also in many cases has been of great value in diagnosing cardiac renal and other conditions. Much pleasure and profit may be derived from a study of diseases of the kidney from this point of view since it forms a basis for a rational therapy and a stimulus toward keener clinical observation.

The test is a qualitative one of the mode of urinary function as measured by the specific gravity, salt, nitrogen and water excretion in two-hour periods during the day and for a twelve-hour period at night. The normal individual yields specimens with specific gravity figures which vary ten points or more from the highest to the lowest a night urine high in specific gravity 1.018 or more high in its percentage of nitrogen—above 1 per cent—and small in amount—400 ccm or less. The quantities of water, salt and nitrogen excreted approximate the intake. When kidney function becomes involved the first signs are usually demonstrated in the night urine the quantity becomes increased the specific gravity and the nitrogen concentration are lowered. One or all of these changes from the normal may occur. In severe cases of chronic nephritis an advanced degree of functional inadequacy of the kidney is indicated by a markedly fixed and low specific gravity, a diminished output of both salt and nitrogen a tendency to total polyuria and a night urine showing an increased volume, low specific gravity and low concentration of nitrogen. Such functional pictures, however, are not confined to nephritis. They are found regularly in many other conditions: pyelitis, cystitis, hypertrophied prostate, marked anemia, pyelonephritis, polycystic kidney and diabetes insipidus. The cause of diminished renal function it is clear must be sought for in many directions—the urinary passages, the blood, or the kidney itself. Prognosis and therapy will depend largely on the cause of the fundamental impairment and not

on its degree. A divergence between the degree of functional renal involvement and the intensity of the signs and symptoms of nephritis is frequently found and accentuates the lack of parallelism there may be between functional and anatomical lesions.

In chronic diffuse (parenchymatous) nephritis, the condition of renal function is characterized by its variability. In these instances, the results of the test meal have proved to be extremely valuable in giving an idea of the status of the salt, nitrogen and water excretion besides the pictures of renal efficiency as a whole. The findings in myocardial insufficiency vary according to the activity of the heart. Distinct differences are found with myocardial decomposition and the accumulation of oedema, the period of eliminating oedema, and subsequently when the cardiac compensation is again fully established, it requires some time before the kidney resumes its normal activity. This intervening period is indicated by a tendency to a low fixed specific gravity and a nocturnal polyuria. During the period of full myocardial decompensation the results of kidney activity are very characteristic the specific gravity is markedly fixed at the level of about 1.020 the salt output is diminished, that of nitrogen is high in marked contrast to the salt and there is oliguria. When chronic nephritis and cardiac decompensation coexist as they so often do in hypertensive nephritis the urine may exhibit the characteristics due to either lesion. The determining factor is probably to be found in the chronic nephritis which may or may not be so far advanced as to present an unchanging barrier to the influence of renal congestion.

O'Hara found that in general, salt excretion is impaired before there is much disturbance of water and nitrogen excretion in most patients. Salt and water excretion behave very similarly, the nitrogen excretion is greatly impaired usually only in the severe cases. Salt, water and nitrogen excretion show some disturbance in even the very mild cases in which phenolsulphonephthalein excretion is normal, and there is no increased blood nitrogen. These dietary tests can not be used in all cases of chronic nephritis. They cannot be carried out in cases that are very severe. The methods involving the determinations of the indices of excretion of urea and salt avoid a number of the difficulties met with in carrying out the dietary tests. These indices were determined in fifteen cases in which both dietary tests were carried out, and the indices seemed to give as much information as the other

tests and to possess distinct advantages inasmuch as they can be determined for practically every patient and require considerably less time and less labor in their execution. According to the author the great advantage of all three of these tests is that they give information as to disturbed renal function in those mild cases in which phenol sulphonephthalein excretion is normal and the blood urea nitrogen is not increased.

Griessmann has made exact studies of the excretion of water, sodium chloride and nitrogen in small series (five) of nephritis. The patients were placed on a diet of rice, condensed milk and raspberry juice. The diet was analyzed for its content in the above mentioned constituents and the patients were kept on it until they had reached a state of equilibrium. Each experiment was divided into four periods: (1) The preliminary period in which the patient was kept on a milk or milk rice diet until there was equilibrium in nitrogen, sodium chloride and water. (2) During the second period, the patient received the standard diet plus 20 gm. of sodium chloride. The additional salt dissolved in 400 ccm. of water was given only on the first day of this period. (3) In the third period one or two liters of water were added to the standard diet. The extra water was also given only on the first day of the period. (4) In the fourth period, the patient received the standard diet plus 20 gm. of urea dissolved in 250 ccm. of water on the first day. Two of the patients had markedly contracted sclerotic kidneys as autopsy proved. Two suffered from arteriosclerotic renal changes while the fifth had chronic glomerulo-nephritis. The changes in water excretion were the least noticeable. Defect in the excretion of sodium chloride was found in all of the cases, being especially marked in one of the cases of interstitial nephritis. In the other cases there was a moderate delay in excretion. The urea excretion was studied in only three cases. A marked delay was noted in one of these also. A patient with contracted kidney. The experiments show Griessmann says that as a rule disturbances in excretion of sodium chloride and nitrogen are combined. Nevertheless there are cases in which the disturbance of function chiefly affects only the salt or the urea. Thus the classification of renal diseases on the basis of excretion of salt and urea (Widal, Mueller) seems justifiable.

EXAMINATION OF BLOOD AND URINE FOR METABOLIC FRACTIONS

The composition of the blood under normal and pathological conditions is given (so far as the

substances that we are interested in are concerned) in the following table taken from Hawk

COMPOSITION OF NORMAL BLOOD AND OF THE BLOOD IN CERTAIN PATHOLOGICAL CONDITIONS*

| | Normal | Chronic Nephritis | Uremia |
|--------------------------|--------|-------------------|---------|
| Total Solids, per cent | 20 | 3-9 | 3-8 |
| Total N, per cent | 3 | 3-3 | 7-7 |
| Non-protein, nitrogen | 2-35 | 3-30 | 00-390 |
| Urea nitrogen | 2-13 | 0-70 | 70-300 |
| Uric acid | 3 | 4 | 4-7 |
| Creatinine | 3-9 | 4-3 | 3-30 |
| Amino-acid nitrogen | 4-3 | 0 | 0-16 |
| Ammonia nitrogen | 0 | 0 | 1 |
| Chlorides as N, per cent | 0.4 | 0.55-0.75 | 45-0.64 |

*The figures are in milligrams per 100 gram. blood.

The non protein nitrogenous constituents of the blood. Ever since the time Prevost and Dumas who in 1823 first demonstrated an increase of the urea of the blood after extirpation of the kidneys in animals the total non-protein nitrogen and the urea of the blood have been the subject of repeated investigations and have been accorded considerable importance in the diagnosis and prognosis of Bright's disease. Owing however to the fact that the methods employed have been various and more or less subject to error the results obtained have been conflicting. This may be readily seen when we find that the total non protein nitrogen in the normal person is given as anywhere from 25 to 60 mg. per hundred ccm. of blood. The brilliant methods recently devised by Folin render possible the accurate estimation of these substances in a small amount of blood from 2 to 5 ccm. sufficing for all the analyses. The increase in accuracy depends on an improved method of removing the proteins from the blood and the use of Nessler's solution makes it possible to work with small quantities of blood.

The term non protein nitrogen explains itself. It includes all the nitrogenous substances remaining after the removal of proteins by precipitation in the case of Folin's method by means of methyl alcohol and later zinc chloride. Other names for it are incoagulable nitrogen, filtrate nitrogen, rest or retention nitrogen.

Folin's method for the total non protein nitrogen is essentially a micro-kjeldahl process, in which the ammonia after neutralization of the products of digestion is blown over into a collecting vessel by a current of air instead of by distillation and is estimated by the use of Nessler's solution and the colorimeter as in water analysis. His method for urea depends on the quantitative breaking down of this substance to ammonia at a temperature of 150 C. and its

subsequent estimation in the same manner as the total nitrogen. The figures obtained represent urea estimated as nitrogen and include the ammonia nitrogen which however is so small in normal blood, and presumably in most forms of disease as to be negligible.

Folin and Denis working with the new methods found in a series of sixteen healthy adults the total non-protein nitrogen varying within narrow limits and from 22 to 26 mg per 100 ccm of blood, while the urea nitrogen was exactly half as much from 12 to 13 mg. The blood was taken in the forenoon from three to six hours after breakfast. The figures given by previous investigators already mentioned, are all too high by reason of faulty methods.

Tilston and Comfort studied one hundred and forty-two cases of one sort or another. For the purpose of classification they have been divided into eleven groups as follows: (1) chronic nephritis (2) other diseases of the kidneys and of the genito-urinary tract (3) lead poisoning (4) the complications of pregnancy (5) acute intestinal obstruction (6) diseases of the heart and aorta (7) the acute infections (8) syphilis (9) tuberculosis (10) diseases of the nervous system (11) miscellaneous diseases. These will be taken up in order.

For practical purposes figures for the nitrogen below 30 mg they considered normal those from 30 to 35 slightly from 35 to 50 considerably and from 50 to 100 greatly increased. One hundred milligrams or more constitute a very dangerous elevation of the waste nitrogen. In the case of urea nitrogen anything over 16 mg is probably abnormal and above 25 mg considerably increased.

Tilston and Comfort concluded from their investigations that

1. In the fasting healthy adult the total non-protein nitrogen varied between 22.0 and 25 mg per 100 ccm of blood and the urea nitrogen between 12 and 14 mg.

2. The effect of a full meal with meat in the case of the healthy adult was a rise of total non-protein nitrogen averaging 4.7 mg and of urea averaging 2.5 mg.

3. In both chronic interstitial and chronic diffuse nephritis the cases without symptoms of uræmia showed normal or moderately elevated values the uræmic cases, with one possible exception showed a great increase in both nitrogen and urea.

4. The excretion of phenolsulphonphthalein was roughly proportionate to the degree of retention the cases with 60 mg or over of total

nitrogen all showed 5 per cent or less phenolsulphonphthalein excretion. Many cases, however with a considerable impairment of phenolsulphonphthalein excretion showed no signs of retention and a moderate amount of retention of waste nitrogen often occurred with no impairment of the elimination of phthalein.

5. The proportion of urea nitrogen to the total non-protein nitrogen in disease varied from 32 to 85 per cent. Where the nitrogen was normal the urea usually was about one-half the total nitrogen where it was elevated the urea usually but by no means always constituted about 70 per cent of the whole. No reasons could be found for these variations. The determination of the total non-protein nitrogen alone is therefore more valuable than that of the urea alone.

6. The estimation of the non-protein nitrogen is of the greatest value in the diagnosis of uræmia. Amounts of 100 mg or over were encountered in only two conditions besides uræmia namely acute intestinal obstruction and profound anaemia from hæmolytic. Only one case of uræmia without marked increase in nitrogen was encountered out of a total of eight cases.

7. The determination of the total non-protein nitrogen is a great aid in the prognosis of chronic nephritis. Patients showing over 100 mg with one exception did not live more than thirty-five days.

8. The results of blood analysis furnish the best guide as to the diet to be given in nephritis cases with a considerable retention require a restriction of protein and by this means a return to normal figures may be brought about if the azotæmia is not too pronounced. In cases of outspoken uræmia however no marked reduction of the azotæmia has resulted from a protein-poor diet. Nephritis with a normal amount of non-protein nitrogen does not call for any marked decrease of protein diet.

9. In chronic passive congestion of the kidneys there is little or no retention of nitrogenous waste products.

10. In pyelitis the presence of azotæmia probably indicates involvement of the parenchyma of the kidney.

1. A marked elevation of the non-protein nitrogen of urea renders the patient a poor operative risk and the azotæmia should be overcome by diet if possible before an operation is attempted in all cases in which delay is permissible. In hypertrophy of the prostate, for example a low-protein diet may be combined with drainage of the bladder as a preliminary to operation.

12 Chronic lead poisoning was accompanied by evidence of retention in all cases examined

13 The eclampsia of pregnancy seldom shows a marked increase in non-protein nitrogen and urea. It is therefore distinct from uræmia. Anal vsis of the blood will usually serve to distinguish between uræmia and eclampsia

14. In acute intestinal obstruction a tremendous increase in the nitrogenous waste products was found in all of the three cases examined. A return to normal took place in the two which recovered

15 Compensated valvular disease of the heart, aortic aneurism, acute pericarditis with effusion and acute endocarditis in the absence of disease of the kidneys all showed normal values

16 In acute lobar pneumonia a considerable increase was seen in the majority of cases reaching its maximum toward the crises but bearing no relation to the time at which resolution took place. Typhoid fever, acute rheumatism and uncomplicated scarlatina showed normal figures

17 Syphilis showed a considerable degree of retention in 36 per cent of the cases examined, evident in all stages of the disease

18 In cerebral hæmorrhage, hysteria and neurasthenia no increase was found

19 Severe anæmia due to hæmolysis showed a marked retention, reaching in one case 100 mg of nitrogen

20 In uncomplicated diabetes the values were normal, both cases examined in coma showed retention

21 The administration of thyroid extract in two cases of myxœdema caused an increase in both nitrogen and urea. Both cases were complicated with chronic nephritis.

22 In exophthalmic goiter the blood nitrogen and urea were normal in amount

23 No changes were met with in malignant disease which could not be ascribed to a complication with renal disease

24 In a case of acute yellow atrophy the proportion of urea nitrogen to the total non protein nitrogen was decreased although there was a considerable degree of azotæmia

Folin, Denis and Seymour state. It would seem from these results as though the direct determination of the non protein nitrogen (and urea) in the blood furnishes a more reliable guide to what might be called the protein tolerance of patients than can be obtained from any direct test of kidney efficiency, for of all tests yet devised for this purpose the phenolsulphone-phthalein test of Rowntree and Geraghty is admittedly the best

The methods for the determination of non protein nitrogen, urea, creatinin etc. in the blood may be found excellently described in Hawks' Practical Physiological Chemistry, 1916 fifth edition page 270

An elaborate investigation of the non protein nitrogen of the blood recently published by Bang of Lund, Sweden has brought a confirmation of some of the earlier chemical statistics of the blood as well as an addition to the known facts. Thus the average figure for the non protein nitrogen is placed, as the result of numerous new analyses at 25 mg per hundred gm of blood out of this an average of 15 mg is apportioned to urea. These values correspond fairly closely with those first established in this country for man by Folin and Denis

It has been demonstrated that both amino-acids and urea representing food and waste respectively from the standpoint of nitrogenous metabolism occur in the corpuscles as well as in the plasma of the blood, the formed elements being permeable to such compounds. An analogous behavior is known in the case of blood sugar. According to the newest analysis of Bang both the corpuscles and the plasma of human blood as a rule contain practically the same content of total residual nitrogen, urea and amino-acids. In several instances Bang has observed an increase in the urea content of the blood without any comparable change in the other non protein nitrogenous constituents during starvation. This was demonstrated however to be associated with a lack of water and disappeared as soon as a suitable intake of water was assured. The ingestion of protein did not lead in Bang's experience to any noteworthy concentration of amino-acids in the blood unless the intake was inordinately large. Evidently a renal loss of amino-acids is thus averted so long as the blood content does not rise to an excretion level. The urea content may be decidedly increased however thus showing the speedy conversion of amino acid nitrogen into its characteristic end product of nitrogenous waste.

Myers and Lough found that estimation of the creatinin of the blood in nephritis was valuable as a diagnostic and prognostic test. The increase of creatinin in the blood is considered a safer index of the decreased permeability of the kidneys than that of urea or uric acid because creatinin on a meat free diet entirely endogenous in origin and formation is very constant whereas the formation of urea and uric acid is subject even normally to great fluctuations. In the authors' sixty three cases the creatinin wa

estimated by a modified Folin method, oxalated and laked blood being saturated with picric acid filtered, treated with sodium hydroxide and then compared colorimetrically with a standard creatinin solution of known strength, to which the alkali has also been added. A rise in the creatinin above 2.5 mg. to 100 ccm. of blood was found to signify renal involvement almost invariably. Creatinin values of from 2.5 to 3 mg. are to be viewed with suspicion from 3 to 5 mg. as decidedly unfavorable and over 5 mg. as probably indicating an early fatal termination.

The creatinin excretion is retarded when the kidneys are affected. The more retarded the excretion the more extended is the pathological process in the kidneys. Pronounced retardation of the creatinin excretion may be of import in determining the indication for an interruption of pregnancy.

Ambard's coefficient. The uræmic coefficient of Ambard is the ratio between the urea in the blood and the square root of the urea excreted in the urine.

Lamy and Mayer endeavored to compare the concentration of urea in the blood with the rate of excretion in the urine. They did not recognize the importance of the rate of blood flow and consequently were not able to find any relation between the two values. Five years later Ambard and Moreno announced their laws of renal function. They were three in number and reduced the study of kidney activity to a physicochemical basis.

The first law dealt with the relation of the rate of output of urea to the concentration of urea in the blood. The rate of output was found to vary directly with the square of concentration of urea in the blood if the concentration of urea in the urine remained constant. In other words if the quantity of urea in the blood were doubled the amount excreted in a given time would be quadrupled.

According to the second law the rate of excretion of urea varied inversely with the square root of the concentration of urea in the urine if the blood urea remained constant. Under these conditions a quadrupling of the concentration would result in a halving of the rate of output.

The third law was a combination of the first and second. If the concentration of the urea in the blood and urine varied simultaneously then the rate of output would vary directly as the square of the concentration of urea in the blood and inversely as the square root of that in the urine.

The following formula used in calculating the coefficient, is derived from the third law by the addition of correction factors for the patients' weight and for a standard urinary concentration of 25 gm. urea per liter

$$K = \frac{U}{\frac{\sqrt{D \times 70}}{P} \times \sqrt{\frac{C}{25}}}$$

- K = coefficient of urea excretion
 U = grams of urea per liter of blood.
 D = output of urea in grams in 24 hours
 P = weight of patient in kilograms.
 C = grams of urea per liter of urine
 70 = standard weight in kilograms.
 25 = standard concentration of urea in the urine.

The normal value of the constant (K) is from 0.06 to 0.09. With a decreasing kidney efficiency there is a rise in the constant and with an increasing function the coefficient falls (Lewis).

Kholzoff has been giving a thorough trial to Ambard's formula for estimating the work of the kidneys by the proportion between the urea in the blood and in the urine. Kholzoff thinks that the total amount of urea and chlorides eliminated by the kidneys during the twenty-four hours is of greater import than the percentage in urine or blood. At the same time he lauds the Ambard index as accurate and reliable giving a better idea of the renal function than any other method. He says the method is not reliable for determining the function of each kidney separately because the technique of collecting urine from each kidney is not perfect. Yet it is highly important to collect the whole amount of urine without any losses. Therefore this method can have only a limited use as, for instance, for the purpose of determining the function of both kidneys or when there is but one kidney from congenital deformity or from disease.

Legueu has obtained very favorable results with this method. The uræmic constant in case of a tuberculous process in the kidney is modified by the extent of the functional disturbance entailed by the morbid process also by the concomitant or consecutive inflammation in the kidney and by the extent of the compensating hypertrophy of the sound mate or of parts of the diseased kidney. The sound mate in time may become so functionally capable that it may entirely compensate the diseased kidney in this case the uræmic constant would indicate normal conditions in regard to the secretion of urine, and the diseased kidney could be removed without the slightest hesitation (Legueu).

Legueu found that in every case in which nephrectomy was done on the basis of a normal uræmic constant—about 0.07—the ultimate course confirmed the correctness of the premises. A number of typical cases are described in detail out of the seventy in which the formula was calculated in advance of the nephrectomy. In twenty two cases it proved impossible to introduce the ureteral catheter and here the uræmic constant was almost the sole reliance. None of the seventy patients died from renal insufficiency except one and this was the only case in which the findings of the uræmic constant had been disregarded and for certain special reasons the operation was attempted contrary to its teachings. The fatal outcome of the nephrectomy in this case sustains anew the diagnostic importance of this method of estimating by a mathematical formula the work the kidneys are capable of doing in each individual.

From a thorough study of the Ambard coefficient Lewis drew the following conclusions

1 The laws of function are not followed with mathematical exactness in young and active individuals but under routine conditions they are remarkably accurate. They are correct in principle.

2 The coefficient of urea excretion is subject to certain variations in normals but any value below 0.06 or above 0.09 should be regarded as abnormal unless the excessive variation can be readily explained.

3 The coefficient is absolutely independent of the blood urea concentration. Its level is governed by the condition of renal function.

4 The coefficient is depressed in fever in hyperthyroidism in hypertension with early changes in the renal arterioles, and in early chronic diffuse nephritis. The depression is an evidence of increased renal activity due to irritation.

5 The coefficient is raised in myxædema.

6 There is an increase in the coefficient in myocardial insufficiency.

7 The coefficient is above normal in nephritis with renal insufficiency. This increase is more evident in chronic diffuse nephritis than in the vascular type due to the greater frequency of renal insufficiency in the former cases. The coefficient gives an excellent means of following the changes in renal function and of measuring the rate of progress of the disease.

8 There is a marked uniformity in the results of the phenolsulphonethalein test and the coefficient in all stages of nephritis.

9 The prognostic value of the coefficient is considerable. Values above 0.2 are seen only in the severe cases while constants persistently above 0.3 are found only in persons with a maximal impairment of renal function. A coefficient above 0.2 has a graver import in vascular nephritis than in that of the chronic diffuse type.

10 For an accurate prognosis repeated determinations of the coefficient are of the greatest importance.

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Risley E. H. Hemostasis by Interposition of Muscle, Fat and Fascia in Parenchymatous Organs. *J. G. S. (Surg.)* 9 81

Reports of experimental work in the use of tissues such as muscle, fat and fascia, in order to determine which of these constitute the best hemostatic form the basis of Risley's paper.

The author's procedure is first to control all bleeding as far as possible by firm gauze pressure while a suitable piece of muscle is being excised for application against the bleeding surface remaining. The gauze is then withdrawn and the washed muscle to the area is held in place by firm gauze pressure until it becomes adherent. It is anchored by firm interrupted sutures, removing the gauze pressure gradually. Should bleeding continue, he uses more muscle if the whole bleeding area is not covered with the first piece of muscle. He lays the first piece by layer, fascia sewed down as firmly as possible to hold the muscle in place, sewing up without rubber tissue drainage as the case indicates.

In cases where it does not seem advisable to sacrifice muscle tissue, he divides the use of fascia first and secondly fat tissue. He claims that where as muscle tissue only needs to be secured in place because of its adhesiveness, fascia and fat must necessarily be sewed over or into the bleeding area as closely as possible. For suture he uses No. 00 catgut suture in silk.

The author reports his results in detail in twelve experiments on dogs, in such organs as the liver and kidneys, in which these different tissues were used as hemostatics. As a result, these experiments arrive at the following conclusions:

The ideal hemostatic in wounds of parenchymatous organs is interposed muscle tissue. It is at the time of the operation from the patient's own body.

2. Such muscle in order to most effectively stimulate fibrin formation should be jaggedly cut with a knife and not crushed as with scissors cut nor should its hemostatic properties be extracted by its contact with salt solutions.

3. Fascia and fat act to a more limited degree as hemostatics, fascia more than fat, but both very much less than muscle. In the liver, however,

both fascia and fat seem to be very efficient hemostatics.

4. These tissues readily unite to the bleeding surface to which they are sewed and form a smooth, solid scar.

5. Microscopical examination of specimens removed at varying intervals after operation shows in this series absence of sepsis, the beginning of transmigration of muscle into fibrous tissue, the partial absorption of fat and change into fibrous tissue, no change in the fascial transplants. In practically every case, firm blending of the interposed tissue with the cut surface of the parenchymatous tissue, the formation of new blood channels and no degenerative changes of any note.

6. He concludes, therefore, that muscle, fascia and fat can be safely interposed into these tissues and later acting immediately as hemostatics later undergo fibrous changes and form a firm union with the parenchymatous tissue. E. C. R. SMITH.

Potter C. Technical Features in Suprapubic, Perineal and Rectal Operations, with Special Reference to Exposure. *Ch. J. Recorder* 665

In suprapubic cystotomy (with and without drainage) where there is a low grade or absent cystitis, also preliminary to suprapubic prostatectomy, Potter uses a transverse incision through the skin and fascia divides the recti and pyramidales longitudinally, pushes the peritoneum from the bladder fundus and makes a high transverse incision in the bladder, thus obtaining a well-placed, clear exposure. He recommends this incision in all clean cystotomies. The fascia is stitched to the muscle and the muscle and fascia stitched to the bladder. The bladder is closed with a modified Connell intestinal suture for the inner layer, leading down to but not including the mucosa and reinforcing with continuous chromic catgut suture. A median incision is better in all cases requiring a long-continued drainage, where there is much cystitis.

Air is used to distend the bladder after the incision is completed down to the bladder. Potter prefers suprapubic prostatectomy except for carcinoma and in obese people. He gives illustrations of a perineal board which he devised for elevating the pelvis in perineal dissections or operations and says

the elevation is a very important feature for proper perineal exposure.

Thorough preliminary treatment is essential in cases of residual urine cystitis, and pyelitis with renal insufficiency. He uses suprapubic drainage or frequent catheterization (every two hours) and not a retention catheter. Where there is much cystitis or retention he favors the two-stage method, the cystotomy being done under local anesthesia and a median incision with a 2.5 cm. wide drainage tube. Very little irrigation is used. At the second operation this incision is enlarged sufficiently to insert two fingers. For prostatectomy combined local (novocaine and adrenalin) and nitrous-oxide-oxygen anesthesia or analgesia is used. Ether is never used. Patients are allowed to sit up in bed on the second day massaged frequently given plenty of salt and soda solution by hypodermoclysis and proctoclysis and are out of bed on the tenth day. High hip elevation and good exposure are absolutely essential in perineal prostatectomy, vesiculectomy and vesiculotomy and Krasko operations. Zuckerkandl's incision is advocated for seminal vesical operations as it gives more working room.

In conclusion then, it may be said that only refinement in technique or improvement in technical features which helps the preliminary preparation lessens the anesthetic dangers and shortens the time of operation is conclusive proof for its adoption.

CARL R. STEINKE.

ASEPTIC AND ANTISEPTIC SURGERY

Saner F. D. and Dean C.: *The Carrel Treatment of Wounds*. *Gy's Hosp. Gaz.* 1917, xxxi, 24.

The main principle carried out in this treatment is the primary sterilization of wounds with subsequent secondary suture. Sterilization is carried out by means of a solution containing sodium hypochlorite as the active agent and of a certain strength—0.45 to 0.50 per cent. Great importance is attached to the necessity of the solution being of this strength, for if below it is insufficiently active while if above it is irritating to the tissue and skin. The wound is constantly kept moist by means of intermittent irrigation which with a minimum of disturbance to the patient corresponds to constant dressings and keeps a constant supply of antiseptics in the wound. The progress of the wound is controlled by means of bacteriological examination suture being performed when the wound has been relatively sterile for about a week.

The solution is passed into the wound by means of fine rubber tubes which are perforated at one extremity and tied distally. The perforations are multiple and vary in number. The tubes are connected by means of a long rubber tube with a reservoir of one liter capacity. They are changed only if they become blocked. The wound is irrigated every two hours. The greatest care must be taken that the solution reaches every recess of the wound. The wound is dressed daily care being taken to disturb the patient as little as possible. The skin

around the wound is covered with fine gauze soaked in sterilized vaseline.

Wounds can be classified roughly in two groups (1) wounds which come under this treatment within the first twenty four to thirty six hours (2) those which are admitted after this. In the first group excision of the wound is at once performed. Fragments of metal and clothing are removed and the tubes are placed in every recess of the wound. In the second group suppuration may or may not have ensued. If there is pus under tension or cellulitis a good incision is at once made. This is done preferably in bed under gas. The main idea, however if suppuration be present is to do as little operatively as possible. Tubes are inserted in the openings already present and irrigation commenced. The further course is controlled by the bacteriological results. When the wound is sterile secondary suture is performed and the wound closed by the best possible means. In the suturing of wounds the usual methods are employed in deep wounds buried sutures are advised so as to leave no dead space. In an extensive loss of skin, undermining grafting, etc. is done. Nerve suture may be attempted when the wound is sterile bone-grafting is performed under the same conditions but the wound is then left open and irrigated until the bacteriological examinations show that the wound is again sterile. This method of sterilization has been used with striking success in the treatment of empyemata. Great care should be used in any operation in the control of all bleeding points by ligature since hypochlorite dissolves blood-clot.

The procedure at the Carrel Institute is as follows

Every two days one or more films are taken from the wound stained preferably with thionin blue and examined under the 1/12th power of the microscope. In the case of a large wound several films are made from separate places. Ten fields are chosen from different parts of the film and the average number of organisms per field estimated.

If a patient has several wounds a separate chart may be used for each or the same chart may be used and different colored pencils employed.

When the number of organisms falls to 1 per 5 or 6 fields or in the case of a very small and quite superficial wound to 2 per field the wound is considered to be surgically sterile and suture may be performed. There are certain reservations however namely that this grade of sterility must be found to persist for five or six days and that the only organisms to be seen are single cocci and diplococci. If a chain of streptococci, or a group of staphylococci or a bacillus is seen the wound cannot be closed without a risk of its breaking down.

If however the above stage of sterility has been reached closure of the wound may be safely performed and it is claimed that nerve-suture may be done at the same time. As sterilization proceeds, it is noticed that the percentage of mononuclear and endothelial cells which were absent at first rises.

Apart from indicating when the wound may be closed, the bacterial curve is of great value in showing whether operative interference is necessary. If the general direction of the curve is in the down grade, no notice need be taken of isolated rises. If however it does not come below a certain point, the cause responsible for the unsatisfactory progress must be sought.

For the preparation of Dakin's solution the necessary ingredients are (1) sodium bicarbonate (2) anhydrous sodium carbonate, and (3) bleaching powder.

If the anhydrous sodium carbonate cannot be obtained it is possible to use the crystallized salt but 85 times as much must be used. It is dissolved in water and then added to the bleaching powder. The mixture must be kept in a container which will not react with it. To do this 20 grams are taken and dissolved in 100 ml of water. This is allowed to stand for 24 hours and is then filtered. 100 cc of this is placed in a beaker. 100 cc of a 10 per cent potassium iodide solution is added to the mixture. The mixture is run from a retort until discoloration occurs. The number of cc used multiplied by 7.5 gives the percentage of available chlorine in the sample of bleaching powder.

After having weighed these out separately put the bleaching powder in a 1-liter bottle with 500 ml of ordinary oil water. Leave for 24 hours with frequent shaking. Simultaneously put the potassium iodide in a second 1-liter bottle with 500 ml of water.

After 24 hours mix the two and shake. Let the precipitate settle and after about 10 hours pour off the clear supernatant fluid into a filter. The filtered product is dried in a desiccator. The strength can be tested by titration against sodium hyposulphate. Take 10 cc of Dakin's solution, 20 cc of 10 per cent potassium iodide and 10 cc of acetic acid. Run in 10 cc of 10% nitro hyposulphate under dilution. The number of cubic centimeters of sodium hyposulphate used is the percentage of available chlorine in the Dakin.

The presence of free alkali is tested for with phenolphthalein powder. There should be absolutely no pink tinge. Eau de Javelle and Lique Labarraque both give a very strong red coloration with this test. Any hypochlorite containing free alkali is quite unsuitable for surgical use as an antiseptic.

J. H. SMITH.

Ligat, D. Flavin and Brilliant Green in the Treatment of Infected Wounds. *Brit J* 9: 7, 78.

Ligat has employed flavine compounds and brilliant green in upward of 150 cases. In suppurating wounds, after clearing them up he has irrigated the wounds with a 1:1000 solution of the antiseptic in normal saline and finally the wound is covered with gauze soaked in the solution.

He has noted the stimulation to early formation of

granulation tissue. He cites some cases to illustrate the results and states that he has not noticed any toxic effect from the use of the drug whatsoever. Of the two antiseptics, he favors flavine.

M. S. HENDERSON.

Browning, C. H. Gulbransen, R. Kennan, y. E. L. and Thornton, L. H. D. Flavin and Brilliant Green, Powerful Antiseptics with Low Toxicity to the Tissues; Their Use in the Treatment of Infected Wounds. *Brit J* 9: 3.

Of the two substances flavine and brilliant green, the authors consider that flavine is more efficient and more rapid in its action. They found, however, that the brilliant green stimulates the formation of exuberant but well-organized granulation, and a great increase of brilliant green for this purpose. Flavine is one of the acidic group obtained from the anilines.

The following summary:

A substance belonging to the acridine group flavine has been found to possess extremely powerful bactericidal and antiseptic properties which are enhanced rather than diminished by admixture with serum. In this respect flavine differs from all the powerful topical disinfectants.

In the presence of serum, flavine is the most potent bactericide of all those investigated for both taphylococci and bacillus coli. It is equally effective for the staphylococcus and for anaerobes such as bacillus ordensis malignus.

Flavine is also a powerful bactericidal power. It is very much less destructive to the process of phagocytosis and less harmful to the tissues than the other antiseptics. Hence, in high effective concentrations it can be employed without damaging the tissues. Interfering with the natural defensive mechanisms. Brilliant green also compares most favorably with the other antiseptics in these respects.

Clinical results have substantiated the estimate of the therapeutic value of flavine and brilliant green based on the points above noted.

M. S. HENDERSON.

ANÆSTHETICS

Madigan, M. V. Some Observations on the Relation of Blood Pressure to Anæsthesia. *Arch Surg* 9: 7, 78.

If its toxic features and sudden deaths could be eliminated chloroform comes nearest to being the ideal anæsthetic. In regard to safety nitrous oxide and oxygen anæsthesia stands about the same relation to ether that ether does to chloroform but it will not supplant ether simply on its virtues until its several disadvantages are overcome.

Three years of administration of ether by the drop method shows that the blood-pressure furnishes accurate information as to the condition of the patient and that shock may be anticipated and remedial measures instituted in its incipency.

In the initial stage of anesthesia fairly constant changes occur in arterial blood-pressure, a rise during this stage and a fall to normal when surgical anesthesia is reached followed by a gradual drop in blood pressure from the beginning to the end of the operation. Besides this gradual fall there occurs a sharp drop when the incision is made through the abdominal wall and during manipulation of the bowel or of the gall bladder.

Since low blood-pressure is the essential phenomenon of surgical shock, it follows that the anesthetic itself and trauma of the peritoneum or abdominal viscera are shock producing factors when prolonged. The bulk of evidence in the work done to determine the nature of surgical shock seems to indicate that failure of the vasomotor center does not occur. With this point clearly settled and epinephrin exhaustion not applicable it remains to be determined through practical clinical tests whether a reduction of venous tonus due to local paralysis produces stasis or whether an oligemia occurs.

Though the blood-pressure readings furnish an index of the condition of the patient still preventive measures are not effective in all cases. The immediate indication must be directed toward the restoration and maintenance of blood pressure.

Fear and excitement are allayed by morphine and local anesthesia is used to block afferent impulses. Once developed epinephrin in saline solution 1:50,000 or 1:100,000 intravenously is of value while strophanthin intravenously also causes a prolonged rise of pressure. Camphor may be used for its immediate and atropine for its remote effect. The head should be lowered to prevent anemia of the brain and artificial respiration resorted to when required. E. K. ANASTOMO

Muns, W. E.: Blood Pressure and Graphic Vasomotor Changes in the Periphery During Ether Anesthesia. *Am. S. & Phyl.* 9:6 July 645

The author reports experiments upon six dogs, conducted for the purpose of determining the effect of ether upon the vascular system and upon the blood-pressure.

As it required approximately an hour to adjust the plethysmograph and the mercury monometer which was connected to the carotid artery the records of the first hour were not secured.

Three of the experiments covered a period of anesthesia of six hours, or over. Of the other three two were over three hours in duration. In the three shorter experiments the blood pressure was 10 to 70 mm. Hg. lower at the end of the experiment than at the beginning. In the other three the blood pressure was 12 to 21 mm. Hg. higher than at the beginning. In every case the leg volume was greater at the end of the experiment all except one case showing a steady progressive increase up to the very last half hour of the experiment. At death there was a total increase of leg volume of from 2 to 18 cc.

The blood pressure lowering effect of this vasodilatation obtaining throughout the periphery must

be tremendous and yet three of the dogs showed a higher blood-pressure at the end of the experiment than at the beginning although the pulse-rate did not increase during the experiment. In the dogs which showed the increased blood pressure there was a decided increase in the ventricular output compensating for the vasodilatation. In the three dogs whose hearts did not show this compensatory reaction because of organic disease or too early response of the nervous center to the effect of the anesthetic there was a decided and fatal fall of blood pressure.

As it has been shown that trauma to the exposed intestines brings about a reflex vasoconstriction it is safe to say that in an ordinary major operation with ether as the anesthetic a moderate amount of excitation from handling is a helpful factor. There can be no question that there are at times occasions, with the patient on the verge of syncope from ether depression, when a vigorous cutaneous or visceral irritation would restore the vasomotor tonus resulting in a beneficial reflex rise in pressure.

However if excitant stimuli are excessive they lead to eventual organic exhaustion. Ether combines a period of excitation and depression first exciting then depressing. The depression is its essential effect. It is evident that when sensory stimuli and the anesthetic are exhibited together there is one period when the excitation from the surgical technique and the depression from the drug are pitted against each other to the benefit of the patient. There is a later period when the two become allies in effect and total functional incapacity and death come about quicker than when only one agent has been at work.

The conclusions are:

1. Ordinary third stage ether anesthesia prolonged beyond one hour results in more or less marked vasodilatation in the periphery. This is a progressive change more or less regular in character, increasing directly in proportion to the lengthening time of administration.

2. There is a direct relationship between the condition of the vasomotor control and the blood pressure.

3. The end result of ether depression is loss of function. The symptom-complex known as post-operative shock is a combination of the effects of excitation and depression and varies directly with the algebraic sum of these two factors.

4. The vasomotor center is the variable factor in bringing about the vasomotor change the variation of response is directly dependent upon the changes in the vasomotor center produced by ether.

JAMES W. TURNER.

Larkey, C. J.: The Prophylaxis and Treatment of Postanesthetic Vomiting. *J. M. Soc. N. Y.* 19:6 July 8.

While the single act of vomiting which often takes place just before the return to consciousness is usually an advantage the occurrence of this after-effect

is very disagreeable if it persists, and all means toward eliminating it should be adopted.

The etiology of vomiting is not entirely clear, some attributing it to the kind of anæsthetic used, to the mental condition of the patient, to the patience of the surgeon, or to the irritating effect of the swallowed saliva. The author attributes post-anæsthetic vomiting to the acidosis which follows the physicochemical combination of the anæsthetic with the lipoids, which in turn is followed by increased acidity of the cell content and increased capacity for water.

To obviate the production of acids the preoperative preparation should include a regular diet with plenty of fat by foods up till noon of the day before operation, then a supper of cereals, milk with albumin, water and sugar. If acetone is present in the urine, the proteins should be cut down and the carbohydrates increased. Water containing calcium is useful while the administration of sodium bicarbonate and lactose, one drachm of each every four hours for forty-eight hours before operation is advisable. Following operation the patient is given a 5 per cent solution of anhydrous dextrose by the drip method per rectum using 50 ccm. In acute dilatation of the stomach lavage with soda bicarbonate is of value. The use of alkaline mineral waters, either plain or as a fruit acid, works excellently. If there is no vomiting carbohydrate feeding may be started a few hours after the operation.

The most striking evidence of the part played by acidosis in the production of post-anæsthetic vomiting and the efficacy of prophylaxis is seen in those who have had several anæsthetics, giving a history of severe vomiting with no prophylactic treatment.

L. E. ARMSTRONG.

SURGICAL INSTRUMENTS AND APPARATUS

Murney N. Apparatus for Transfusion of Blood by the Sodium Citrate Method. *J. A. M. Soc.*, 9, in, 53.

The author describes a simplified method which consists of a salarman tube to which is fitted a rubber stopper with three holes into which two Luer glass tubes are placed. One Luer is connected to a No. 6 Luer needle by means of a nine inch piece of catheter rubber, the other Luer is connected by a short rubber tube to a sterile cotton filter which is in turn connected to a mouth piece by means of a short rubber tube. A 10-ccm. Luer syringe is connected to the third hole of the stopper; this is used to add citrate solution.

The advantages claimed are ease of construction; it does not require autoclaving; it can be boiled. Repeated transfusions can be given at short intervals; the amount can be accurately measured and the rate of flow regulated; blood does not need to be transferred from one vessel to another; it is not necessary to expose the veins; one assistant is all that is needed.

LESLIE H. LADD.

SURGERY OF THE HEAD AND NECK

HEAD

Sargeant, P. and Holmes, G. Report of Late Results of Gunshot Wounds of the Head. *J. Roy. Army Med. Corps*, 9, 6, xxvii, Sept.

Late results in head wounds are always of interest since they are largely dependent upon the mode of early treatment.

The authors had ample opportunity to study their cases many of whom were injured 18 months and two years ago. They had authority from Sir Alfred Keogh, D.G. to visit all the hospitals in London and vicinity. This gave them an opportunity to study the condition of 1,339 patients. After excluding scalp wounds without any bony or cerebral injury and where the nature of the injury was uncertain, as well as others in which the information was too recent for a study of late cases, the accurate data is given concerning 610 patients. 75 per cent of whom were studied three months after the infliction of injury. The cases included in the list are more severe than the average of cases diagnosed as gunshot wounds of the head.

The mortality after evacuating to England was as follows: Of the 1,339 cases studied in 8 hospitals,

the mortality was 37 per cent. Some of the cases were severe and died within two weeks after admission. But 5 cases succumbed after three months, the other deaths occurred before the end of this time. The immediate cause of death could not be ascertained in a considerable number of the cases. In 2 postmortem examinations, it was found that nearly all had died of the spread of septic infection. In one remarkable case, the bullet had passed through the right frontal region, the base of the brain, then ricocheted off the Pterion portion of the temporal bone, thence through the third ventricle and the posterior third of the corpus callosum and into the left occipital lobe. The patient died at the end of three and one half months very suddenly when all cerebral symptoms had disappeared, as a result of rupture of an aneurism of the posterior communicating artery.

Eleven patients died after operation: 2 after excision of cerebral hernia; 2 after primary operations, 1 after an attempt to remove a lodged shrapnel ball deeply embedded in brain tissue, and in the remainder death followed operations to relieve hernia or to evacuate cerebral abscess. In 10 out of

17 other cases studied at postmortem meningitis and cerebral abscess caused death of the 7 others.

No death occurred in the cases studied when the dura remained uninjured by the missile or at operation.

The improvement of physical disabilities with the lapse of time is spoken of in a most encouraging way. The amount of disability is of course dependent upon the severity of the injury and the location of the lesion. The authors hold to the view that most of the paralyses, sensory and visual disturbances, etc. noted in the earlier stages are due not so much to the result of destruction of brain tissue as to concussion, edema, and vascular disturbances that extend beyond the primary injury and here they might have added as a result of the vibratory force incident to high velocity on the part of the projectile. The temporary nature of paralyses in the cord is due to the same cause, and here we have noted that the symptoms subside early just as they are known to pass away with time in many cases of brain injury.

Disappearance of symptoms directly due to destruction of brain tissue are more persistent and yet the amount of improvement in some of the cases was surprising. A small proportion of cases with perforating and penetrating wounds of the skull afflicted with paralyses, sensory disturbances, hemianopia, etc. have already been returned to active service and others have returned to wage earning vocations in civil life.

Amelioration has been especially noticeable in many of the cases of various forms of paralysis due to injury of the superior longitudinal sinus. As to neurological complications, the authors note that but few cases of insanity or epilepsy have developed among the convalescent patients or those who have been restored to duty. Dullness, loss of memory, irritability, and childishness are oftentimes present in the earlier stages but these tend to disappear or diminish with time. Only 8 cases of insanity were noted in the first twelve months.

As evidence of the apparent rarity of insanity after head injuries it is pointed out that only one case was received at the London County Council Area, where all cases of insanity in invalided soldiers naturally go from at least one-seventh of the population of the United Kingdom. Major F. W. Mott of the London County Council Asylums states that he is very skeptical of a large number of cases of insanity arising from traumatic causes. He believes that head injuries apart from syphilis, alcohol, and hereditary neuropathic taint seldom cause mental affection.

Likewise epilepsy of the Jacksonian type has been surprisingly rare and seen in later stages it has been less common than was feared from the generally accepted opinions on the subject. It has occurred in 6 per cent of the 610 cases. In 8 one convulsion had taken place in 12 only a few 5 men were reported to have had five or six convulsions while in 11 the convulsions were frequent.

The administration of bromide in all serious cranial injuries until the wound is healed and for some months afterward is considered advisable. Headache is mentioned among other neurological complications, and again a feeling of weight, pressure or throbbing in the head, aggravated by noise, fatigue, exertion, or emotion, attacks of dizziness and nervous or deficient control over emotions or feelings are noted. Many of the patients exhibit a considerable change in temperament. They become depressed, moody, irritable, or emotional and unable to concentrate their attention on any physical or intellectual work. These symptoms are neurasthenic in type. They are independent of the site or severity of the original wound and they are often as severe when a minor injury like a scalp wound has been received as in the case of a serious compound fracture of the skull and they seem to develop just as often after an operation as not.

In reviewing these remote effects of head wounds it is well to remember that a great deal of our knowledge of this class of cases has been handed down to us by medicomilitary writers who had viewed the subject from a military standpoint after years of experience.

Longmore from his extensive experience, states that few cases of head injury from gunshot, be they contusion or fracture, fail to give symptoms of cerebral disturbance. The fact that paralytic symptoms are more severe at first and tend to disappear wholly or partly has been a matter of common observation by military surgeons. Dizziness, irritability, headache, and other of the neurological symptoms are prone to recur while on duty in hot climates, so that soldiers frequently have to be discharged from the service on this account. Although many of the cases of head wounds have been restored to the colors it is doubtful if they could continue on duty in tropical countries.

Out of 610 head cases to reach England 120 had cerebral hernia. The progress and outcome in cases with this unfortunate complication are dealt with according to the different types of wounds. Of the 610 cases 96 had missiles lodged in the brain, and of 26 from whom the missile had been removed by operation 6 developed hernia cerebri, with 2 deaths. Out of 69 cases with missiles *in situ* 14 developed hernia cerebri with 2 deaths. Of the 16 who survived with hernia the hernia had shrunk and the wound had healed when last heard from, and in 2 the hernia was smaller and the wounds were healing rapidly three and four months respectively after the date of injury.

In 68 cases of through-and-through shots 14 developed cerebral hernia. Four out of the 14 died and in 8 of the others the wounds were completely healed when last heard from. Out of 310 cases of penetrating wounds without retained missile 86 reached England with cerebral hernia. There were 19 deaths among these and in 49 the wounds healed completely. Of the 86 61 had been operated upon abroad.

Mention is made of 69 cases of lodged missile in the brain at some distance from the point of entry. A few of the missiles were rifle bullets, and a few were shrapnel balls, but the great majority were fragments of shell frequently multiple and not compressible. Four of the 69 cases died and of the surviving 65 cases had been wounded less than three months previously, 5 between three and six months, between six and twelve months and for over one year. In 6 per cent of the cases, the wounds had completely healed, in 30 per cent complete recovery had occurred and no symptoms of cerebral lesion were present. In 30 per cent the neurological symptoms had improved to remarkable extent, 5 per cent hemiplegia, hemianopia, curvatura, still persisted but the condition is attributable to the damage done by the missile rather than to its presence.

The conclusion is as follows:
We agree with the authors that the late result of head wounds as shown by their report is more satisfactory than had been generally expected. It is observed that the proportion of patients who die after transfer to England (head wounds) is small but the same is true of all wounds of the head.

Late complications such as cerebral abscess are relatively rare and late complications such as insanity and epilepsy are as yet more common than has been foretold. The elimination of cerebral hernia is doubtless due to adequate treatment of the wounds, the beginning and as of the late sequelae more than on year should be allowed to pass before definite treatment can be made as to their possible occurrence.

The authors recommend only a surgical intervention at the first stage as may be called for to establish necessary drainage and the healing of the wound. Every precaution should be taken to prevent the development of bacterial infection. The decision to attempt removal of lodged foreign bodies, the brain is sound since it may involve spread of infection and further destruction of brain tissue but to state that many patients with foreign bodies lodged deeply in the brain are scarcely more liable to serious complications than men in whom the brain had been merely exposed and lacerated sounds premature. Few of the short time which has elapsed since the occurrence of injury and the lack of opportunity to study the cases and the varying and trying conditions of war.

LOUIS A. LA GARDE.

Lewis, P. Acrocephaly. In *J. D. Child* 97, 111, 6.

The author reports two cases of acrocephaly, sometimes called oxycephaly or *Thurnschiebel* and gives an extensive review of the literature brought down to date.

The most probable cause of the condition is a premature ossification of the cranial sutures but the underlying cause is unknown. Heredity may

play a rôle. The malformation of the orbit is generally supposed to be due to synostoses, affecting the base of the skull. Whether the narrowing of the optic canal is due to pressure downward and forward of the superior orbital plate or whether the atrophy of the optic nerve is first caused by intracranial pressure and the narrow optic canal is simply a lack of development corresponding to the small size of the nerve is matter of dispute.

The striking features of the condition are the deformity of the skull and the exophthalmos. The exophthalmos may be extreme. Vision may be unaffected or totally destroyed. Optic atrophy is the most constant ophthalmologic finding. There is usually a high rehard palate. Roentgenograms show dimpling of the inner tables of the skull.

Mortality may not be affected. Headache is common. Dislocation of the eyeball may occur. There may be all grades and kinds of associated abnormalities of the hands and feet. Frequently there is defect of the nose.

There is no satisfactory treatment. Two patients whom Schlosse reports were treated by turning down a sharp bony flap on the forehead and while the dura and frontal lobe were lifted up the superior portion of the optic canal was removed with a chisel. They were not benefited so far as visual improvement was concerned.

Reproductions of photographs and roentgenograms illustrate the cases.

New G. B. Radium in the Treatment of Lymphangoma of the Tongue. *J. Lamer* 96, 609.

The author reports two cases successfully treated by radium at the May Clinic. One patient was a girl of twelve in whom the tongue had been increasing in size for about eight years. She had had a number of X-ray treatments without any effect. The tongue protruded from the mouth and could not be drawn back. Treatment with radium, unscreened, caused prompt retrogression of the process.

The second case was that of a boy of two and one-half years. Two and one-half months after treatment the tumor had entirely disappeared and the tongue fit it appeared no mal.

The author feels that radium is a specific for angiomatous lymphangoma and its great value lies in the fact that it gives such remarkable results in conditions like those reported which are not surgical.

I. GERBER.

Hanes, F. M., and Willis, A. M. Circumscribed Cysts of the Leptomeninges; Report of a Successful Operative Case. In *J. M. S.* 96, 419, 859.

The authors report a case and give a brief review of the literature. Among 45 cases operated on for suspected tumor of the cord by Krause, cystic meninges was found in 11 or 24 per cent. Although rare in the medical literature these cases are not so

uncommon as would appear and are doubtless being overlooked. The etiology is uncertain but probably both trauma and toxic inflammation are factors. Any inflammatory processes in the neighboring structures of the pia arachnoid, such as spinal tuberculosis or osteomyelitis are considered probable causes in some cases. At operation, on incision of the dura a thin walled translucent cyst protrudes owing to pressure by the contained fluid. On puncture the cyst wall collapses and becomes difficult to see. The cord is flattened, the pial vessels engorged, and the veins of the cord distal to the cyst congested and tortuous.

The symptoms are those of cord tumor. Most observers believe the differential diagnosis between tumor and cystic meningitis impossible. The finding of spinal fluid below the level of the lesion as observed in the author's case is explained by the obstruction of the cyst and formation of a lumbar cul-de-sac.

The treatment is surgical. In the author's case laminectomy and incision of the cyst wall was followed by rapid and remarkable improvement.

HORACE BIRNEY

Kerrison P D: Cerebellar Abscess Symptoms and Differential Diagnosis. *Laryngoscope* 46: 916-927, 1937

In meager outline the author discusses the general and focal symptoms of cerebellar abscess. The importance of the general symptoms relative to temperature and pulse, headache, vomiting, nervous and mental symptoms, and eye-ground changes is due to the fact that frequently the focal symptoms are absent at which time a careful analysis of the general symptoms might aid in determining the probable site of the lesion. As the author says:

With complete absence of focal symptoms one might in the presence of low-grade fever, low pulse rate, recurrent vomiting, persistent occipital headache with mentality unclouded, reach a fairly logical inference as to the site of a suspected lesion.

Focal symptoms are due to (1) injury to cortical centers controlling the direction sense as referred to particular joints, (2) injury to cerebellar structures controlling motor co-ordination, and (3) pressure transmitted to motor tracts in the medulla and cord.

The following focal symptoms are then discussed though the author makes plain the fact that all are not always found in any one case. Nystagmus, cerebellar ataxia, inco-ordination ataxia, occasional peculiarities of gait, diadochokinesis, loss of pointing accuracy, loss of pointing reaction, in vestibular irritation, hemiparesis, catalepsy and speech defects.

For a discussion of the above the original paper will have to be consulted as it does not lend itself to further abstracting. In fact the subject is so thoroughly condensed by the author that it is in itself only an abstract of the matter under discussion.

In concluding the paper the author mentions that differential points between cerebellar abscess on the

one hand and temporosphenoidal abscess and acute diffuse suppurative labyrinthitis on the other. As an appendix he gives a note on Barany's theory of cerebellar localization.

OTTO M. ROTT

Meyers, I. L. Cerebellar Localization: an Experimental Study by a New Method. *J. Am. M. Ass.* 916-917, 1915

In a recently published communication the author advanced the view based on experimental evidence which he obtained by galvanometrically determining the electric potential on the two sides of the body after unilateral ablation of the cerebellum that the cerebellum does not as is generally assumed act motorially on the periphery but that it acts primarily on the motor and tonus centers of the encephalon (motor cortex of the cerebrum, paracerebellar nuclei and possibly also the nuclei of the midbrain) its function being to inhibit or control and regulate the activity of these nuclei and that the phenomena of cerebellar deficiency are therefore to be interpreted as phenomena of hyperactivity of the latter structures. The cerebellum according to this view is a purely afferent mechanism bearing in a broad sense the same relationship to the motor (and tonus) nuclei of the encephalon that a posterior root ganglion does to the motor cells of the anterior horn of the cord.

If this conception of the cerebellar function is correct the author's failure to obtain constant and definite responses on excitation of the organ at once becomes clear. The cerebellum being an afferent sensory structure the motor effects obtained on its excitation are obviously due to the transfer of the stimulus to the subjacent structures, and not to stimulation of the cerebellum itself and are therefore vague and indefinite just as the diffuse and ambiguous movements obtained on excitation of the central end of a divided posterior root are due primarily to the effects of the stimulus on the motor-cells of the cord. The fact which is admitted by all observers that a far more powerful current is required to evoke a motor response from the cerebellum than is required for a similar response from the cerebrum also lends support to this view. It is well known that with powerful currents motor responses are also obtained from the sensory regions of the cerebrum, such as the parietal and temporosphenoidal lobes, the effects being admittedly due to the diffusion of the current to the neighboring motor zone.

The author therefore carried out the following experiments. He first produced small circumscribed lesions of certain lobules of the cerebellum using cats in all the experiments. The organ was reached by cutting the skin over the occipital region in the median line, severing the large mass of muscles on the posterior side of the neck at their attachment at the lambdoid suture and, after retracting them downward and outward as far as possible, opening the skull by means of a small trephine one third inch in diameter.

After he produced the desired lesions, he kept the animals alive for a period of time varying from a week to twelve days to make certain they would recover and that they were not suffering from meningitis. Only the general phenomena resulting from the operation hemorrhage and shock from loss of cerebellar substance were noted. When these phenomena subsided and the animals showed unmistakable signs of recovery they were subjected to the section of the rest of the brain.

The function of the cerebellum is to inhibit control and regulate the activity of the motor cortex of the cerebrum and the paracerebellar nuclei of the medulla.

The phenomena of cerebellar deficiency are, accordingly, to be interpreted as the omens of hyperfunctional and not hypofunctional activity.

The cerebellum is functionally differentiated for the various muscle groups of the body indirectly by being primarily related through its various motor centers in the cerebrum and the tonus enters in the medulla, just as postero root ganglion is a motor sense, related to a certain muscle complex through its corresponding group of motor cells in the anterior horn of the cord.

The paramedian lobe is, thus, in a manner related to its homolateral hindlimb and probably also to the contralateral hindlimb through the crus secundum to the homolateral hindlimb very likely exclusively and the crus primum to the homolateral forelimb.

These results are in general conformity with the theory of cerebellar localization as postulated by Boik. They differ from it only as regards the paramedian lobe which Boik assumed was the center for unilateral movements of the muscles of the trunk.

The author believes that this study might prove to be of distinct practical importance. It is possible, he states, that in suspected cases of cerebellar tumor or disease in which the phenomena of cerebellar deficiency, the ataxic gait, the hypermetria, the adiadochokinesis in the arms, etc., are too slight to be recognized, the demonstration within physiologic limits of a cerebral excitant such as the vinous preparation of bairne or even ordinary alcohol in moderate doses, might make these phenomena obvious and aid not only in diagnosing an affection of the organ but also in establishing the exact seat of the disturbance.

GEORGE E. BAILEY

Robinson, E. F. Lat. Effect of Brain Trauma. *Chicago M. Recorder* 9 6 xxviii, 6 4.

The following cases are presented because of their interesting diagnostic features and the late appearance of symptoms, also because they illustrate the extent that operative interference may be carried to in dealing with the brain tissue itself.

The first case was hematoma of the brain, from an injury sustained February 2, 1915. Operation was performed ten days later. The depressed bone, extradural clot and intracerebral clot were removed

(near Broca's convolution). The patient had recovered all senses by May 10 1915. No later report was received.

The second was a case of epilepsy from brain injury. The man was injured March 10 1899 and had had an uneventful recovery. Three months later he developed epileptiform convulsions. Operation was performed three months later. The convulsions had not recurred four months later.

The third case was a brain cyst from an injury sustained in December 1908. The patient was operated upon eight months later with drainage of the cyst but was not benefited (no time given).

The fourth case was a traumatic abscess of the cerebrum following a gunshot wound of the ear sustained May 1904. The patient had apparently fully recovered but six weeks after the injury unusual symptoms developed. An operation was performed and an abscess of the temporoparietal region drained. The patient returned home July 3 1904 without single mental symptom. No later report is given.

The fifth was a case of traumatic psychic amnesia, from a depressed fracture of the right occipital region caused by a blow on the head. Three and a half years later the patient had persistent headache and wandered away from home but came to himself five days later. One year later a similar attack occurred and he came to his senses eight days later. Operation was performed December 22, 1910 with removal of depressed bone and fascial transplant. July 17 1916 six years after operation, he had not had a return of his abnormal condition. Pathologically Robinson explains the condition as follows: a slow increase in vascular occlusion with contraction of scar tissue a slow thrombosis, or fibrosis.

The conclusions are as follows:

Intracerebral as well as intracranial hemorrhage should be sought.

2. The same should be true of suspected brain abscess.

3. Scar tissue of dura should be removed and fascial transplant used.

4. Cases of Jacksonian epilepsy and psychic amnesia, although they appear late may be benefited if the principle is followed of complete removal of all scar tissue and fascia graft or transplant instituted.

CARL R. STEEDER.

Barnhill, F. J. Disease and Surgery of the Fifth Nerve. *Laryngoscope* 9 6 xxvii, 35.

Referring to the extensive distribution of the fifth nerve to the otolaryngologist's domain, and the necessity of arriving at a diagnosis concerning the anatomical seat of the irritative focus, the author states that a solution may be reached only when (1) a definite knowledge of the anatomy of the whole head is before the investigator (2) when the nasal interior and all its accessory sinuses have been inspected by accurate methods and (3) when the

surgeon may call to his aid the service of the oculist, roentgenologist, internist, dentist, neurologist, pathologist, bacteriologist, and serologist.

Among proven causes of affections of this nerve are (1) the general infectious diseases including typhoid malaria, and syphilis (2) extraneural pressure from any cause as from a tumor an osseous growth springing from the wall of the neural foramen from traumatic or other infiltrates in or near the nerve-trunk (3) infection of the nerve itself.

Surgical treatment should not be applied to any branch of the nerve itself in any case in which the cause of the disease can be determined until the cause if of a surgical nature, has received surgical care. As to surgical measures applied to the nerve itself first in order is the injection into the nerve trunk or its ganglion of origin of some substance that more or less permanently destroys the nerve and blocks sensation secondly, destruction of a portion of the nerve trunk and thirdly removal of or destruction of the sensory root of the ganglion.

OTTO M. ROTT

NECK

Cannon W. B. Conditions Affecting Secretion of the Thyroid Gland. *Boston M. & S. J.* 1916 clxxv 562

The fact that physiological activity of a gland is accompanied by an electrical difference was first demonstrated on the submaxillary gland. The anatomic connection of the cervical sympathetic nerve fibers with the thyroid gland has been demonstrated. Stimulation of the sympathetic strand high in the thorax will evoke a current as shown by a galvanometer connected with the thyroid gland and neighboring tissues. Stimulation of the vagus causes no such current. Clamping the blood vessels which supply the thyroid, thus producing anemia, causes no electrical change. Therefore it may reasonably be assumed that the sympathetic fibers of the thyroid gland are true secretory nerves.

Stimulation of the adrenals to increased activity causes the characteristic electrical reaction in the thyroid. During emotional excitement the adrenals are stimulated into the production of greater quantities of a substance which gives rise to the liberation of sugar in the urine, abolition of muscular fatigue, dilatation of bronchioles, inhibition of digestion, redistribution of blood in the body and rapid coagulation—an emergency function to satisfy the needs of a body struggling to protect itself. The normal line of safety for this phenomenon may be crossed or destroyed and an emotional stimulus normally harmless may activate a more or less constant condition of overproduction of these protective reactions.

In the cat, the anterior root of the right phrenic nerve was fused with the right cervical sympathetic thus causing a volley of nerve impulses to the thyroid each time the animal breathed. In four of the animals which survived the operation marked

changes in temperament, physiological reaction and basal metabolism very similar to exophthalmic goiter in man were observed, all symptoms subsiding after resection of the right half of the thyroid was performed.

Cannon concludes that the thyroid is subject to that division of the nervous system which is brought into action in emotional excitement and which causes adrenal secretion. It is probable therefore that the thyroid like the adrenal normally has functions which are performed in times of critical emergency, which function may be only an exaggerated form of the routine activity of the gland.

E. FISCHER.

Kendall E. C.: Recent Advances in Our Knowledge of the Active Constituent in the Thyroid Its Chemical Nature and Function. *Boston M. & S. J.* 1916 clxxv 55

In his work at the Mayo Clinic the author has succeeded in separating a crystalline compound from the thyroid which apparently is the entire active principle of thyroid secretion in its effect on metabolism. This compound which Kendall calls alpha iodine contains 60 per cent iodine. When administered to cretins or to patients with myxedema it exerts all the favorable changes seen after the administration of thyroid extract or powdered thyroid gland. Normal animals treated with this compound show the striking effects of metabolic stimulation parallel to the effects of thyroid intoxication.

E. FISCHER.

Boothby W. M.: The Clinical Value of Metabolic Studies of Thyroid Cases. *Boston M. & S. J.* 1916 clxxv 564

The basal metabolism of normal individuals rarely varies more than 10 per cent and in the respiratory laboratory of the Peter Bent Bingham Hospital in over 600 instances in which tests of metabolism were made in the majority of cases it was within 5 per cent of the normal figure ascertained by DuBois.

Any marked variations from the normal in basal metabolism are ascribed to changes in the endocrine organs. Of these the thyroid furnishes the most marked increase and decrease. In the clinical application of basal metabolism to cases of exophthalmic goiter the author cites several cases to illustrate how the diagnosis can be made in doubtful cases, and how the kind and effect of treatment can be accurately ascertained in each case by successive determinations of basal metabolism. Through this agent the necessary length of the postoperative rest period in thyroidectomy can be accurately determined.

E. FISCHER.

Wilson L. B.: Pathologic Changes in the Sympathetic System in Goiter. *Am. J. M. Sc.* 1916 clxxv 799

The author and Durante have recently reported their findings in superior cervical sympathetic

ganglia removed at operation from sixteen patients having hyperplastic toxic goiter. These he summarizes as follows:

1. Definite histologic changes in the cells of the cervical sympathetic ganglia in hyperplastic toxic (exophthalmic) goiter occurred in all cases examined.

2. These histologic changes consisted of various stages of degeneration, namely (1) hyperchromatization (2) hyperpigmentation (3) chromatolysis and (4) atrophy or (5) granular degeneration of the nerve-cells.

3. Some of the ganglion cells resembled the partially differentiated cells found in the ganglia of infants.

4. Accompanying the more advanced changes in the ganglion cells were similar degenerative changes in the nerve fibers and an increase of connective tissue throughout the ganglion but especially in the outer and middle coats of the vessels and in the periganglion cell.

5. So far as could be determined from the small number of observations the pathologic changes in the cervical sympathetic ganglia were parallel to the stage and intensity of the symptoms of hyperthyroidism and to the hyperplastic and degenerative changes in the thyroid.

The author gives the protocols of eleven patients who died during the course of exophthalmic goiter. These tend to show that early and acute hyperplastic toxic goiter there is present in the superior cervical

and probably also in some degree in the other sympathetic ganglia, a process causing active stimulation, overfunction and progressive stages of degeneration in the ganglion cells. As the symptoms of this disease regress there is a cessation of the degenerative process in the ganglionic cells not previously changed past recovery. After the acute toxic symptoms have ceased for years there is little remaining evidence of the destroyed ganglionic cells, and most of their fatty pigmentary remains have been absorbed.

The author used as control for his present studies, sympathetic ganglia removed from nine patients dying of other diseases, and also the gastric ganglia removed from six patients with trifacial neuralgia. The ganglion cells of patients dying from prolonged wasting diseases may show hyperpigmentation and in some instances varying stages of degeneration, but it is suggested that neither advanced age chronic wasting disease, nor inflammatory processes necessarily cause degenerative changes in the sympathetic ganglia resembling those in exophthalmic goiter.

In four cases in which the sympathetic ganglia of other parts of the body were studied there was no positive evidence of involvement other than hyperpigmentation. This suggests that the involvement in exophthalmic goiter is confined largely to the cervical sympathetics.

HENRY J. VAN DER BRUG.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

DePue, A. and Janssen, C. The Immediate Treatment of Thoracic Wounds; Ambulance Statistics (A propos du traitement immédiat des plaies de thorax et statistiques d'ambulances). *Bull. de la Soc. de Chir. de Paris* 96, 11, 1908.

During the past two years the authors have treated in their ambulance service 300 cases of penetrating thoracic wounds. Of these 290 were without open pneumothorax 6 being complicated with open pneumothorax and traumatopneumia. The wounded arrived in from two to six hours after injury. Among these 290 cases there were 28 recoveries, 74 per cent. there were 77 deaths, 26 per cent. Of the number 65 were uncomplicated thoracic wounds the rest being complicated with abdominal, cranial and other lesions.

Of the 61 cases of open pneumothorax and traumatopneumia there were 39 recoveries 64 per cent. and 22 deaths, 36 per cent. If the complicated cases are deducted the percentages become 71 and 29 respectively.

Classed according to the nature of the projectile the statistics are

| | Number | Percentage of Recoveries | Percentage of Deaths |
|---------------------------|--------|--------------------------|----------------------|
| Rifle bullet wounds | 8 | 84 | 75 |
| Shrapnel bullet wounds | 5 | 72 | 28 |
| Shell wound | 4 | 60 | 40 |
| Blunt and other wounds | 5 | 100 | 00 |
| Unknown projectile wounds | | | |

Thirty five of the total deaths occurred within twenty-four hours of the injury.

Regarding the treatment adopted by the authors in the case of closed penetrating wounds absolute rest is the basis. The men are usually in an extreme state of shock and this must be treated.

If there is intrathoracic effusion puncture is only done in two eventualities. (1) When there is extensive hemothorax which strongly interferes with the respiration in which case the evacuation of fluid is limited to the extent necessary to re-establish respiration. (2) When there are symptoms of infection of the hemothorax in which case an exploratory puncture is followed by a costotomy if the bacteriologic examination is strongly positive.

In open pneumothorax cases if the breach is small it is sutured no attention being paid to the pulmon-

ary lesion. In larger openings pulmonary hæmorrhage is first assured, either by suture of the lung or by compression, followed by systematic tamponade of a special kind which while it provides for complete closure of the thoracic breach allows a certain amount of drainage. The tampon is left in place for forty-eight hours. While removing the dressings the patient is submitted to pressure respiration to avoid suffocation and rupture of adhesions.

Regarding the after treatment, open empyema is treated by Carrel's method. In two cases the authors after sterilizing the pleura closed the orifice allowing the internal cavity in the pleura to persist unfilled. In both cases successful results were obtained.

W A BRENNAN

Barrie G. Regressive Changes in the Breast.
Ann Surg Phila. 9 6 July 707

The author's report is based on a study of 76 specimens of tumors and lesions of the breast covering a period of 15 months at the New York Post Graduate Hospital. Of this number 50 per cent were found to be definitely benign, that is there were no known malignant changes present. The other 50 per cent comprising 38 cases were frankly malignant. This series reduces the usual percentage of malignant tumors receiving surgical aid. Of the malignant lesions, scirrhous carcinoma was the condition most frequently found, while chronic cystic mastitis was the cause of the majority of the operations for benign lesions, two of the cases being in men.

These figures indicate that the profession is becoming more alert and the laity more prompt in seeking surgical relief, facts which have resulted in a decline in malignant breast lesions and in the number of radical operations.

The ages varied from 21 to 68 years, with dates of onset 11 to 60 years. In 66 per cent of the cases of benign tumor the first symptom was an irregular mass or masses in the involved breast; in 30 per cent it was pain and tenderness. In only one case was there a discharge from the nipple and in one a definite retraction of the nipple. In most of the cases the lesions arose in and around the so-called nipple zone.

In 14 cases the entire gland was removed, none of the cases showing any abnormality in skin, nipple, fat, or axillary gland movement.

The author feels that microscopic areas giving the picture of malignancy may exist without detection in many lesions and that operation must be determined by the proper interpretation.

HARRY G SLOAN

Gatewood. Tuberculosis of the Mammary Gland.
J Am M Ass 1916 15 660

The author reports five cases of tuberculous of the breast which have been observed in the Presbyterian Hospital Chicago in the last ten years. These represent 1.04 per cent of all breast cases in which operation was performed. Two of them were un-

doubtedly secondary to a focus elsewhere in the body while the others were probably deuteropathic in the sense that they were secondary to an unrecognized focus elsewhere. Since the classical description by Dubar in 1881 about 180 cases have been reported. About 60 per cent of these cases have been reported as primary but most of them were undoubtedly secondary to some unrecognized focus. Although many pathologists deny the occurrence of primary tuberculosis of the mammary gland there are a few cases on record in which the patient has been accidentally infected with an instrument or in some similar manner has acquired the disease. There is no necropsy record of a primary case.

Grossly there may be a firm nodule of firm consistency giving the impression of an adenofibroma, or there may be several discrete nodules. In such cases the skin remains unbroken as a rule and on section nodules are found which are not hard like carcinoma. A type has been described in which the predominating feature is sclerosis. This type is very rare but may be mistaken for carcinoma. Most of the cases in the literature belong to the confluent variety, i.e. they have broken down giving fluctuation and have gone on to abscess formation. The breast in this type may be twice the size of the opposite one. One or several sinuses lead to the abscess cavities. Retraction of the nipple is nearly always present as it occurs early in the disease. Unilateral involvement is the rule, even though the axillary involvement is bilateral. The lymph nodes are enlarged in 60 to 75 per cent of cases.

Microscopically tuberculosis does not differ a great deal from tuberculosis of other similar tissues. The bacilli are demonstrated with a great deal of difficulty and the experience of most observers has been that they are easier to demonstrate in the pus than in the tissues. Animal inoculation should always be done although in the past it has been much neglected.

Gilberti P. A Case of Bilateral Tuberculosis of the Breast (Sopra il caso di tubercolosi bilaterale della mammella). *Ped clin R ma* 916 xxiii.

Gilberti reports the case of a woman of 50 whose left breast was amputated for tumor. Microscopic examination showed the presence of Koch's bacillus. The woman enjoyed good health for some months after operation, then came again to the author owing to tumefaction of the right breast. This was also removed and histologic examination proved the presence of Koch's bacillus in this also.

The author states that bilaterality of mammary tuberculosis is rare. He finds only three cases reported, those of Albertin Walther and Ceccherelli. In the two latter cases the development of the tuberculous process was simultaneous in both breasts. In the author's case the development in the right breast occurred some time after the operation on the left breast.

The author thinks that in his case as in the greater

part of those described by other observers, the blood is indicated as the route taken by the bacillus to reach the breast. But it is not easy to explain why Koch's bacillus is arrested in the breast which organ appears to be very little adapted to the development of a tubercular process. The author thinks that probably trauma gives the clew and points out that a slight trauma which is passed without notice may be as important in this regard as a severe trauma. Gilberti thinks that the best treatment is early amputation of the breast, never neglecting to make a clearance of the axilla even if it shows only lymphadenitis with limited development.

The results of this treatment are the only ones which in the long run are not disappointing.

W. A. BRECKMAN

Syma, P. Chronic Cystic Mastitis or Abnormal Involution of the Breast. *J. S. G. Phila.* 9 (1) 1917

The author discusses the etiology pathology symptoms and treatment of the malady together with photomicrographs of the various cycles. The disease is primarily an inflammatory one being a response to some circulating toxin. Depending on the stage of the disease the pathological picture varies so that it has received various names from the different observers depending on whether the cystic or adenomatous or fibromatous form was most prominent. It occurs in both women and men. Usually both breasts are affected. Married women who have borne children and those who have not borne children as well as virgins are equally affected. It usually originates during the cancer stage from 30 to the menopause.

Prostatic hypertrophy in the male bears a close resemblance to the processes seen in the breast. As it affects glandular structures more than it does the ducts it will be found in the periphery of the breast. It is characterized by proliferation of the glandular epithelium and of the fibrous tissue which compresses the stroma of the gland. On first chief characteristic is the formation of cysts. The hyperplasia which takes place in the fibrous tissue may be the predominant element giving rise to fibroadenoma or to fibromata depending on whether the predominant element of the fibrous tissue is the glandular elements. The phenomenon in which is of most importance is the behavior of the glandular epithelium from which cancer springs.

Microscopic examination of specimens from different parts of the same breast will show a very wide range in the changes without once and frequently transformation into carcinoma will occur in the same specimen.

The symptoms are tenderness and sometimes pain. There is swelling often a distinct tumor-like masses. There is seldom great increase in the size of the breast. The disease is slow and chronic, but not necessarily progressive. During the early stage resolution may take place. The disease may reach a certain height and remain stationary or it may become carcinoma. Because there is no absolute means of clinically determining whether cancer has already developed in this type of breast the author advocates the removal of the breast itself including the pectoral muscles and the axillary glands in every instance hoping in this way to be able to save one hundred per cent from cancer. In cases merely the breast is removed he thinks a few cases of metastatic cancer will develop where it has been unsuspected at the time of operation. The author quotes various writers who state that the incidence of cancer in chronic cystic mastitis varies from ten to fifty per cent. By following this plan more lives will be saved even though a few unnecessary major operations may be performed.

HARRY G. SLOAN

Sitima, M. The Ultimate Fate of Patients Operated for Carcinoma of the Breast (On the four breast cancer operated patients are let nadvoeden). *Finsk Lak All k Samf.* 9 6, 1 to 6

The author's statistics from Krogglus's surgical clinic in the University of Helsingfors cover 132 cases of carcinoma of the breast of which 134 were operated upon. The author succeeded in following 34 per cent of these patients. About 75 per cent of the patients came from the poorer classes. There was one male patient. The age of the patients ranged between 35 and 80 years the average being about 49 years.

Connected with sexual activity periods the cases tend thus:

| |
|--|
| 1. Menstrual period—45 years—42 cases, or 73 per cent |
| 2. Climacteric period—45 to 55 years—41 cases, or 7 per cent |
| 3. Menopausal period—also 55 years—63 cases, or 45 per cent |

Of the patients 69 per cent were married 31 per cent unmarried. A hereditary predisposition was noted in 6 per cent there had been mastitis 2 per cent of the cases.

The time lapsing from the first observations of the tumor and the time of operations varied from 1 week to 10 years the average being 11.5 months. The carcinoma was in the left breast in 68 patients on the right breast in 2 in 2 there was carcinoma on both breasts.

As regards the size of the tumor at the time of operation:

| | |
|---------------------------------|-------------|
| About the size of pigeon egg in | 6 per cent |
| Hen-egg size greater | 75 per cent |
| Not of the size in | 9 per cent |

Regional glandular swellings were found in 76 per cent of the cases. Four of the cases died in the hospital within a few days within three to four weeks after operation. Secondary operation for recurrence was necessary in 3 patients.

According to the size of the tumor and the regional glandular involvement the cases fall into groups as follows:

| | |
|---|--------------------------|
| Group 1 Showing only small axillary swelling and small tumor | 32 cases, or 24 per cent |
| Group 2 Large gland pockets or nodes in axilla | 70 cases or 53 per cent |
| Group 3 Outside axillary but infra- or supra-clavicular glandular swellings | 26 cases or 20 per cent |
| Groups 4 and 5 Primary operation otherwise earned out | 5 cases, or 3 per cent |

There are 13 patients of Group 1 alive and of Groups 2, 3, 4 and 5 there are 10, 2 and 3 alive respectively. Cases with suprascapular glandular metastases show only a few recoveries.

The extraordinary importance for prognosis which exists in the interval duration between the time of observation of the tumor and the time of operation is described in the following recapitulation:

| Time after Observation | Oper- ated | Now living | Per cent of living operated |
|------------------------|------------|------------|-----------------------------|
| Not exceeding 3 months | 33 | 11 | 33.3 |
| Not exceeding 6 months | 27 | 7 | 25.9 |
| Not exceeding 1 year | 35 | 5 | 14.4 |
| Not exceeding 2 years | 21 | 3 | 14.4 |
| Above 2 years | 17 | 2 | 1.9 |

The favorable prognosis which is noticeable in the early operated cases gradually drops from 33.3 to 1.9 per cent as the interval till operation is extended.

Of 114 cases operated upon 5 years or longer ago:

| | |
|--|----------------|
| Living at present time | 20—18 per cent |
| Dead within 5 years from another disease | 8—7 per cent |
| Dead within 5 years, disease unknown | 5—3 per cent |
| Dead within 5 years, had recovered health | 70—61 per cent |
| Later than 5 years after operation having recovered health | 5—6 per cent |
| No account received of | 8—7 per cent |

114

Thus when the results are considered from the point of view of the 5 year period since operation out of 114 cases there are only 20 complete recoveries, or 18 per cent.

W. A. BREKXAN

Gittinge, J. C. Fetterolf, G. and Mitchell, A. G.
A Study of the Topography of the Pulmonary
Fissures and Lobes in Infants, with Special
Reference to Thoracostomy. *Am. J. Dis. Child*
1916 xlii 579

The authors have attempted to determine accurately the relation of the fissures of the lung to the bony framework of the thorax not only for comparison to the adult type but as a stimulus toward greater accuracy in clinical diagnosis in pleuropulmonary disease. Dissections of the bodies of 14 infants form the basis of this study.

There is a great scarcity of literature on this subject but what there is is briefly reviewed. A short anatomical description of the adult lungs is also given.

The authors in their dissections established what is called the midthoracic line owing to an absence of soft parts. This line is determined by bisecting a horizontal line drawn from the sternum to the spinous processes at the level of the angle of the scapula and lies midway between the midaxillary and postaxillary lines.

It was found that the oblique fissure of the right lung originates from the third to the fifth rib at the spine the average being the fourth rib. The course is downward and forward crossing the midthoracic line on the average at the fifth rib. The termination was from the sixth to the seventh rib just posterior to the costochondral junction the average being the sixth interspace.

The transverse fissure originates in the average case in the fourth interspace and runs forward either beneath the fourth rib or just above or below it. The termination was at the sternum at the upper border of the fourth rib (average).

The oblique fissure of the left lung has its origin in the third space with a course downward and forward crossing the midthoracic line at the fifth rib and terminating in the sixth space just posterior to the costochondral junction. These were the averages in the 14 cases.

It was also determined that the position of the fissures are never influenced by the shape or size of the chest or by the size of the liver. Evidently these changes of the chest go *pari passu* with the development of the lung.

In children it was found that the costophrenic sinus is never expanded as in adults on account of the less vigorous inspirations of the former. This is more pronounced on the right side.

In thoracostomy this must be borne in mind as a low puncture may cross this sinus and enter the liver on the right side or the spleen on the left.

In determining the lowest level for puncture in children it was observed that in no instance did the lungs reach as low in children as in adults and that the left lung reaches slightly lower than the right. Also in the midthoracic line the lowest level of the lung is the seventh rib and in the line of the angle of the scapula it is the ninth rib.

In adults the sixth, seventh, or eighth interspace between the midaxillary and the postaxillary lines are usually chosen for puncture while in children the sixth or seventh is the safest point.

In conclusion the authors state:

1. The fissures of the lung in infancy show practically the same relation to the bony framework of the chest as in adults.

2. The origin, course, and termination of the fissures vary greatly in different individuals.

3. The variations apparently do not depend on any of the anatomic characteristics of the chest and cannot be predicted therefrom.

4. The lower level of the lungs in infants and probably in young children does not extend quite so low as in adults.

5. For this reason and owing to the anatomic characteristics of the bases of the pleural cavities in early life great care should be exercised to avoid damage to the diaphragm in performing thoracostomy.

6. The sixth interspace in the midthoracic line and the seventh or possibly the eighth interspace in the line of the angle of the scapula (at rest) represents the lowest limits of absolute safety for thoracic test in early life. P. M. CHASE.

TRACHEA AND LUNGS

Holmgren G. The Treatment of Tracheal Stenosis. *Zur F. d. k. k. n. d. l. g. b. l. u. n. i.*

A 4-year-old boy had had diphtheria 3 years previous and a healed diphtheria resulted caused by a horizontally placed piece of membranous scar directly beneath the larynx. The larynx was atrophic throughout its entire extent and very small. A laryngotracheotomy was performed, the membranous scar excised, a windowed cannula inserted and dilated by means of iodoform gauze tampons fixed by a string. This dilatation was practiced daily for a few months, a larger tampon being used each time. The result was good. The dilatation, however, at first was carried too far. The vocal cords approached each other only to about 4 mm. After splitting the larynx a narrow strip of the scar was excised with a good result. L. A. JUREK.

Duval P. Pleuropulmonary War Wounds. Gravity of Penetrating Wounds of the Chest (*Blessures de guerre pleuro-pulmonaires graves des plaies pénétrantes du poutre*). *B. H. i. m. m. Soc. de M. d. P.* 96 lu, 876.

Duval's report is based on data received from several surgeons engaged in the theater of war as well as upon his own. In the field hospitals and first-aid stations it is reported that about one third of the cases die immediately due either to hemorrhage or pneumothorax as the result of a large thoracic breach.

In a divisional ambulance service in which 360 wounded were treated, the general mortality was 34.9 per cent. Nearly all these cases were artillery gunshot injuries. In a clearing hospital 38 wounds of the lung gave a mortality of 3 per cent.

Thus of every 100 lung wounds received at the first-aid stations about 30 died and 70 are evacuated 25 per cent die in the division hospitals, about 8 per cent die in the base hospitals—only about 43 such patients out of 100 live and of these many survive with pleural fistulae and chronic pleuritis. The gravity of penetrating chest wounds is due not alone to hemorrhage and pneumothorax but also to pulmonary infection which may be primary or secondary.

In the face of such deplorable results it is necessary to seek some method of surgical intervention which affords better general relief. First, regarding hemorrhage progressive hemorrhage which becomes threatening must be distinguished from immediate severe hemorrhage. For the first if medical means fail recourse may be had to artificial pneumothorax. In severe hemorrhages, which do not yield to ordinary methods direct ligation of the bleeding vessels or deep suture of the pulmonary tissues will assure hemostasis, except in the case of the great peribronchial or neighboring large vessels, a lesson of which seems beyond surgical aid.

In the second place comes the avoidance of pulmonary gangrene and infection of the lungs. Will early operation assure prophylaxis against infection and reduce the mortality figure of 4 per cent? The extirpation of intrapulmonary projectiles at the present time by radiologic methods and with new techniques is an easy matter. If it is decided on it should be done at once within a few hours after injury and not in the period from the second to sixth day when usually a bronchopneumonia is fully developed. The presence of thoracic bone fragment is a further argument of great value for the early and systematic examination of the pulmonary lesion. But in addition to clearance logic demands the closure and suture of the lung wound to protect the pleura from infection proceeding from the lung. This treatment is now followed in Duval's practice but the future must decide whether it is to be continued or abandoned. W. A. BARNES.

HEART AND VASCULAR SYSTEM

Weil P. L., and Lotzeur. Insufflation of Air in Tuberculous Pericarditis with Effusion; Artificial Pneumopericardium and Hydropericardium (*Insufflation d'air dans la péricardite tuberculeuse avec épanchement pneumopéricard et hydropericard artificiel*). *P. s. m. d.* 96 p. 60.

The authors refer to the excellent results obtained by Acord and Vaquez with the treatment instituted by them ten years ago of air infections in serous pleuritis with considerable effusion. The authors believed that equally good results might follow similar treatment in tuberculous pericarditis with effusion and this was successfully demonstrated.

The case referred to was that of a child of 14 years who had been under treatment for embryocardia with secondary edema, cyanosis of the extremities, enlarged liver and ascites. He was in a dying condition. Examination by the authors led to a diagnosis of extensive pericardial effusion with cardiopulmonary cirrhosis which was confirmed radioscopically.

Punctures made July 2, 1916 drew off a considerable quantity of hemorrhagic fluid which did not contain microbes. This was followed by some amelioration but the pericardial effusion reappeared.

soon On July 11 a second paracentesis drew 900 ccm. of seropurulent fluid 500 ccm. of air were immediately injected. Following intervention all symptoms ameliorated and the greatly enlarged liver diminished somewhat. On July 16 puncture drew 300 ccm. of non purulent clear serosanguinous fluid and was followed by injection of 300 ccm. of air.

Radioscopic examination then showed that the pericardium was clear but on the edge of the heart there was a fluid pocket about the right lobe. This pocket was evacuated under the control of the screen 40 ccm. of clear citrine fluid were withdrawn and the same amount of air injected. All the pericardial cavity was then observed to be quite clear.

The subsequent punctures were as follows, each being followed by the injection of air equal in quantity to the fluid withdrawn.

Aug. 3—380 ccm.—15 days after last puncture.

Sept. 5—900 ccm.—33 days after last puncture.

Oct. 23—750 ccm.—48 days after last puncture.

The general condition became greatly improved. The patient increased in weight the skin looked healthy the urine increased, and the appetite was better. The enlarged liver however persisted and the effusions slowly reappeared.

The operation was in no sense painful. Only once there was some coughing toward the end of the injection. Another time there was a slight subcutaneous emphysema without pneumothorax which disappeared in a few hours. There was never any fever.

The technique in pericarditis differs from that in

pleurisy. For the pleura every time that 500 ccm. is withdrawn it is replaced by an equal quantity of air which facilitates the ulterior evacuation of the effusion. In pericarditis all the fluid must first be drawn off before injecting air otherwise evacuation will be interrupted.

The air injected is the ordinary atmospheric air. It is purified in passing through the rubber tubes of the injecting pump. During the treatments the patients diet is generous and nourishing and in the author's case two sun baths were given each day.

The authors point out that air injections into the inflamed pericardium do not give rise to any pathologic symptom there is no pain, no dyspnea nor cardiac trouble. After paracentesis and air injection the effusion is slowly reproduced and the pneumopericardium is then replaced by a hydropneumopericardium but without the manifestation of any symptoms. The presence of fluid can be noted, however by percussion of the patient when lying down.

The authors believe that the therapeutic results of air injection in the pericardium are as brilliant as those already obtained in the pleura. Fluid is reproduced more slowly and punctures can be spaced moreover the hemorrhagic fluid is succeeded by a seropurulent fluid then it becomes clear and citrine and no longer changes. As a further advantage the injections permit the avoidance of pericardial adhesions and the onset of cardiac symphysis and thus obviate a chronic pericarditis.

The authors point out the great value obtained by making the paracentesis and the injections under the control of the radioscopic screen.

W. A. BREWSTER

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Stevenson G. H., Shaw J. J. M. and Mackenzie C.: Observations on Fifty Laparotomies Performed for Gunshot Wounds of the Abdomen. *La cdt Lond* 1916 cxli 173.

The authors give the results in 50 laparotomies performed at a casualty clearing station located about five and one-fifth miles from the fighting front in the trenches located in a building formerly used as a college. Many of the cases were operated upon five to six hours from the time of injury one was operated upon two and one-half hours after being wounded, while others did not reach the operating table until the expiration of twelve to twenty four hours.

The expectant plan of treatment was employed in the early part of the war but the development of the clearing station and added facilities for operation and nursing close to the line of fire have favored

early operation. In the pre-operative days of the war a ward was specially set aside in the clearing station for treatment by the expectant plan where all cases suspected of intraperitoneal injury underwent the treatment of starvation and morphia.

Figures from these cases give the following results: total cases 335 transferred to base 201 deaths 134. This gives a mortality of 40 per cent. Compared to the operated cases this low mortality is considered fallacious for the following reasons: (1) Many of the abdominal cases died at field ambulances and the chief cases treated by conservation were those not considered to be intraperitoneal when examined at the field ambulance. (2) Evidence of the number of intraperitoneal cases is entirely lacking. (3) There is no evidence of the future course of the so-called recoveries.

If the number of deaths are analyzed with reference to the period of time the man was able to

survive his wound the figures will show total number of deaths, 134 died within forty-eight hours after admission, 84 died after three days, 50

These figures show that 17 per cent of the patients who died survived their injuries over three days and then died of peritonitis as result of leakage of intestinal contents which could have in all probability been prevented if the cases had been operated upon at admission. Many of the 50 deaths could have been avoided by operative interference and doubtless some of the 84 cases might have been saved if treated likewise. We have reason to believe that if the 701 cases transferred—the majority after two or three days—the greater number were not injured intraperitoneally.

The types of abdominal wound meet with are: (1) Anteroposterior perforated wounds which must of necessity be intraperitoneal. (2) Wounds apparently intraperitoneal but extraperitoneal, like side-to-side wounds. The bullet follows planes of abdominal muscles without entering the peritoneum. (3) Those which are doubtful, occurring in the flanks, all of which require exploration during anesthesia to investigate the course of the bullet. These wounds are apt to perforate the large bowel or cause fracture of the pelvic bones. (4) Wound with the trace of distance has buttock wounds best and should wound the iliac entering these parts toward the abdomen in some cases and enter the peritoneum and lesions are apt to be overlooked. (5) Those owing to involving the peritoneal cavity plus other important extraperitoneal structures e.g. small intestine plus small intestine plus bladder in the lung etc.

As to the condition of admission from the hospital standpoint the cases are the severe. Patient which require immediate laparotomy are the prostrate kind. They are pale, anxious and cold, having a bluish tinge about the lips which fades into the gray pallor of the face. There is low petulant cry if drinks there is complaint of pain on movement of the body or extension of the lower limbs. The site of the wound is the abdomen, back, flanks, buttock. The patient has a rapid pulse of small low tension, rigid abdomen moving but slightly on respiration with dullness all over in the flanks and generally accompanied with history of vomiting. The diagnosis in such cases is evident at glance and operation should be done at the earliest possible moment. Although the patient may be pulseless the best chance lies in operative interference.

A few hours of delay and observation are permissible if the patient has fairly strong pulse below 95 with no history of vomiting, no signs of hemorrhage when he can hold his breath for over five seconds without experiencing severe pain when he can stand pressure on all parts of the abdomen except immediately around the wound and when he can raise his head voluntarily from the pillow without much discomfort. Such patient should be

carefully watched he should receive nothing by mouth the pulse should be recorded hourly and the nurse should report especially if the patient vomits after being made warm and comfortable in bed. In all cases of doubt an exploratory laparotomy should be made.

Operation is also in order in cases which show rigidity and tenderness localized on one side or one quadrant of the abdomen at the same time that the appearance and pulse indicate a serious condition. In such cases one is apt to find a missile lodged in a soft organ usually the liver or in the neighborhood of the unperforated part of the posterior wall of the large bowel with loss of blood between the layers of the mesentery. Although not so urgent as cases exhibiting infection and hemorrhage in the general peritoneal cavity it is always safer to operate in such cases.

The technique of operation in military practice differs but little from that of civil practice but the following points are worthy of note.

Preparation of patient. (1) Morphine is administered under the skin before operation unless large doses have just been given at casualty clearing stations. (2) Saline is used subcutaneously and intravenously during and after the operation. (3) The iodine method is employed to disinfect the skin in cases of wound involving a large area when it is preferred. (4) The entrance and exit wounds are excised fresh instruments should be used for aseptic laparotomy. (5) Before donning rubber gloves for the final operation exploration should be done with the naked finger in all doubtful cases especially in flank wounds, under anesthesia. (6) Warmth is the anesthetic preferred given by the aid of an improvised apparatus made of a thermos flask and a pair of kitchen bellows which are operated by the foot of the anesthetist. (7) Patients are operated upon at once—half hour after admission at most. Delay is poor surgery. Cases with grave prognosis, with distended abdomen have been incised when blood has been put out as though the vena cava had been cut. In no case of recovery the iliac vein was secured. (8) The median incision is preferred. It gives freer access to every part of the cavity. The incision is seldom found in lesions remote from the entrance wound, but experience demonstrates that but little harm develops by letting it remain *in situ*. (9) In wounds of the small gut the sewing is done with fine thread in two layers, tension on the mesentery should be avoided, continuous suture. End-to-end anastomosis is employed where resection is necessary except cases where several feet of gut have to be removed and the lateral anastomosis is employed. As suture compared to resection many cases are best suited to the latter and it is preferred since it is quicker than suture of many perforations, say twelve in number. Suture in the transverse axis is preferable to the longitudinal, but too much tension need not be laid on the narrowing which is apt to follow the latter as the gut has

great powers of expansion. (j) Lesions of the colon require a different technique since they present a different picture. Unlike lesions in the small intestine the tissues surrounding the injury are much more involved and they exhibit a tendency toward secondary infection and slough. In many of these cases it is in order to excise a V shaped piece of gut and then suture while others require a colostomy. In many cases there is enormous hemorrhage, usually emanating from wounds having a point of entrance in the lumbar region posteriorly. (k) Wounds of the liver and spleen are usually packed unless it is possible to suture them. Wounds of the kidney are not frequently seen. The slight ones are left alone without much risk. urinary fistulae usually get well. A kidney badly pulped should be removed. (l) The gut is carefully washed with saline while outside the abdominal wound, and the abdominal cavity is thoroughly washed out with saline or euol and mopped dry. Large drainage tubes are placed in the pelvis and flanks in badly infected cases. (m) The abdominal incision is brought together in layers, some silkworm-gut sutures are run through all the layers save the peritoneum.

As to the after treatment and sequelae: the important symptom of collapse is treated by elevating the foot of the bed. As the pulse becomes stronger the head of the bed is raised by placing two blocks under it and as improvement continues the Fowler position is gradually assumed and maintained until the danger of sepsis has passed. Small saline injections per rectum with brandy are given every four hours for the first twenty four hours. Small sips of water or milk and water may be given by mouth at once. In cases where suffering from thirst and hunger are acute, the use of chewing gum has been allowed with good results.

The extreme restlessness so common for the first two or three days is best controlled by repeated administration of morphia. The distention noted in cases admitted several hours after the time of injury and preceding operation is treated by subcutaneous injection of pituitary extract immediately after operation. In other cases distention is treated by turpentine enemata, or pituitary extract followed in a half hour by glycerine enema. There is no doubt that pituitary extract is the most valuable drug in the after treatment of abdominal cases. It is often followed by a movement of the bowel in a half hour to one hour after the injection. The administration of pituitary extract is at times followed by intense pain which may be avoided by giving one sixth grain morphia with the injection. Bronchitis is not so frequently seen since the administration of hot ether has been introduced. When it occurs it is treated by giving a mixture of carbonate of ammonia and potassium iodide. Vomiting and hiccough are treated by stomach lavage. They sometimes yield to the administration of small doses of bicarbonate of soda or tincture of iodine.

Pelvic abscess and suppuration of the original

wound or incision appear as late sequelae. In badly infected cases it is advisable to use catgut instead of threads in the deeper layers of the abdominal wound, as the latter are apt to prolong suppuration.

In discussing the pathology of wounds in the hollow viscera the everted mucous membrane of the small intestine with the characteristic rosette appearance is commented upon. It is present at the points of entrance and exit. This is the most common type of perforation noted but at times in lieu of a perforation the intestine is torn across in several places. The tear does not usually extend into the mesentery. The tear in the convexity of the bowel, the authors suggest, may be the result of vibratory force which is distributed at the point of impact plus the muscular action of the bowel, aided by the tension of the mesentery. This theory of the effects of the vibratory or explosive force acting on the weaker and outer segment of the gut finds support in those cases of ruptured loops of small intestine in which the projectile sets up lateral waves while traversing the abdominal parietes without entering the peritoneal cavity. Such cases were noted by Makins in the South African War and they have been frequently noted in the present war. The fact that the short pointed rifle bullet is unstable and frequently travels at a tangent to its line of flight should not be forgotten as a possible cause of complete rupture, rather than a simple perforation going in and out such as occurs when the bullet makes a regular impact.

Another possible effect of vibratory force on the small intestine is the paralytic distention of the bowel. This is most frequently seen in resection cases, and its presence is properly attributed to the complete rupture of the continuity of the muscular coats which hinders the transmission of peristalsis. When distention is present to any extent the prognosis is bad, and bowel concussion, as it has been called as a result of the lateral transmission of the energy of the bullet in the form of vibratory force has been considered as a possible factor in the etiology of paralytic distention.

Wounds of the large intestine are frequently on the posterior and lateral aspects and are often extraperitoneal. Their gravity and the greater tendency to sloughing than in the wounds of the small gut is commented upon. Infection in the surrounding devitalized tissues is the result of contamination with virulent micro-organisms contained in faecal matter. Such cases are prone to spreading cellulitis and unless promptly and effectually drained they become fatal, as noted by the English surgeons in the Boer War. The wounds in the large gut have no marked features, and eversion of the mucous coat is not usually present.

Stomach wounds seem to have a distinct tendency toward infiltration and sloughing of the surrounding tissues otherwise they present no features of note.

Out of the 50 laparotomies detailed in this important report the recovery rate is surprisingly good—34 per cent. This is far better than results

obtained in war hitherto and it compares favorably with results after gunshot wounds of the abdomen by military rifle bullets in times of peace.

In a study of 29 laparotomies which the reviewer analyzed from the reports of the surgeon-general of the army for the years 1903-06 under war conditions the recovery rate was 29 per cent. In another group analyzed from the same reports for the years 1903-06 3 laparotomies under peace conditions gave a recovery rate of 38 per cent. A study of results of gunshot wounds of the abdomen by military surgeons in peace and war shows that the mortality after laparotomy prior to the present war tallied with the figures we have given very closely. It should be remembered that the opportunities to control the environment in trench warfare are exceptionally good when compared to like opportunities with armies who are shifting their positions constantly in the theater. The result of the expert surgeons in the Anglo-Boer Russo-Japanese, and Turko-Balkan wars would doubtfully have been far better if their operating rooms had been located at fixed points near the fighting line.

All cases are operated upon at this season, clearing at times except those who remain in bed and actually dying. The view is held that all intraperitoneal perforations of the gut in the victim is almost sure to die if not operated upon and that it is right to give him a chance even though the chance be so small as one thousandth. Many of the cases were pulseless on admission and the pulse was only felt as flicker and yet in these cases where the latter condition prevailed recovery followed. Four cases in which it was considered undesirable to operate ended in death shortly after admission. Times of stress overcrowding and an overworked personnel are the only condition which prevent operation on practically all gunshot wounds of the abdomen.

The report is accompanied by a tabular statement which includes a great deal of interesting data, and it concludes with the following summary of the part involved in those ending in recovery and in death:

| | |
|--|----|
| Cases that recovered | |
| Small intestine alone | |
| Small and large intestine | |
| Large intestine alone | |
| Stomach and liver | |
| Liver | |
| Hemorrhage without perforation of intestine | |
| Wound of ureters | |
| Total | 33 |
| Cases that recovered | |
| Wound of small gut | |
| Wound of large and small gut | |
| Wounds of large intestine alone | |
| Wounds of small intestine and bladder | |
| Wounds of liver alone | |
| Wounds of liver associated with other viscera | |
| Laceration of ureters | |
| Fracture of pelvis with retroperitoneal hemorrhage | |
| Total | 33 |

LOUIS A. LA GARDE.

Robertson, W. A.: Oblique Inguinal Hernia in Infants. *W. A. M. A.* 97, 12, 7.

A short review is given of the embryology of hernia and the different varieties discussed. The treatment recommended in the early cases is the careful use of a truss. In certain instances however operative treatment is necessary.

The operation outlined is as follows: or incision 2 or 3 drms the night before, miss one feeding apply tincture of iodine, 3 per cent just before operation. Too much local preparation is apt to irritate the skin.

Make a small incision one inch over the external abdominal ring through the skin and superficial tissue. Grasp the cord with the finger and thumb. Make an incision through its coats, i.e., intercolic, cremaster and transversalis. Separate the sac well especially above draw down after opening it and examining interior transfix and tie off. Cut off the reduced portion and allow it to retract up the canal. If it is a congenital case merely tie off the sac above the testicle and below the external abdominal ring a few horse-hair sutures are all that is required.

If the sac is not found beneath the external ring cut the peritoneum of the external oblique. This will have to be sutured with catgut. The cord need practically never be displaced and in young infants the operation will be found sufficient. The slight knob or sac that retracts locates at the upper and outer quadrant of the internal ring. The adherent inflammation produced in the cord dilates the space in the canal and as a mesenteric shortening relates to the growth of the child, no recurrence need be feared. A colodion dressing is applied covered by a thick pad of absorbent cotton and a layer of oiled muslin. A plaster spica may be applied painted with shellac or a plaster used for both legs is clung to the arm pits. The dressing should be kept dry. The stitches may be removed in seven days. The patient should be kept on his back for two or three weeks. Of course any phimosis is corrected at the same time. A truss may be worn afterward if necessary. If there is much coughing, vomiting, etc., but it is better not to use any support.

The advantage of this operation is its simplicity very little catgut being left in the wound to cause trouble. J. H. SELLERS.

Haynes, I.: Giant Ventral Hernia. *V. T. M. J.* 97, 12, 10.

The author's invention method for treating giant abdominal hernia is as follows:

Large elliptical incisions expose the sac, which, with the external fascia of the abdomen, is cleansed for more than two inches beyond the hernial orifice.

If the sac is to be left practically intact, the elliptical portion of skin must be dissected cleanly away. Usually however the portion of sac corresponding to the elliptical mass of skin is removed with the latter thereby freely opening into the peritoneum.

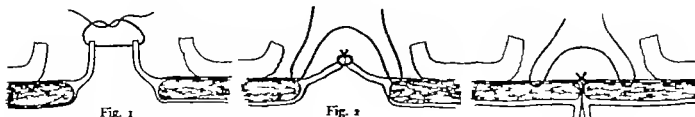


Fig. 1 The introduction of the first suture usually double No. 1 plain gut. Adherent omentum is often sutured between the margins of the sac.

Fig. 2 The sac is closed. Before this is done the first row of kangaroo mattress sutures should be inserted. As represented this suture is not deeply enough placed and it lies parallel with the long axis of the hernia.

toneal cavity. Complications are dealt with in the usual manner.

The intestine should be freed and any raw spot covered with omentum. Extensively adherent omentum need not be freed from the sac unless it seems to be exercising a deleterious traction on the intestine and stomach. The excess of omentum, usually very thick and adherent may be trimmed off at a suitable point and the peritoneal cavity closed by uniting the edges of the sac with this adherent omentum between by an overcasting suture of No. 2 plain gut. Interlocking the stitch is sufficient to arrest oozing from the omentum.

Before the sac has been closed, the first row of the inverting sutures of heavy kangaroo tendon is inserted. These are placed at the edge of the hernial orifice. They bite deeply into this edge for a width of three fourths of an inch and are half an inch apart. Then the sac is closed and this first row of mattress sutures tied — first above and then below until all have been tied. By this first series of sutures the bulging mass of sac also the omentum, if present, is inverted into the abdominal cavity. A second row of the same suture material is placed one inch outside the first row so as to break joints.

Retention sutures are next inserted. These are introduced through the skin from two to four inches from the margin of the incision. They are placed not more than two inches apart and in a figure-of-eight form. When tightened they invert the last row of kangaroo sutures and take all the initial strain. Very large hernias require either double strands of bronze wire gauge No. 30 or single strands of a medium sized twisted wire cable. In the smaller hernias double strands of silkworm gut or Pagenstecher's linen may be used. All these sutures are doubled.

A drain of rubber tissue is laid over the retention sutures and the skin is closed by plain gut. Pagenstecher thread or silkworm-gut. The material is unimportant.

The drain should not be disturbed for three days. It is then withdrawn for an inch and this is repeated every other day until it is entirely removed. These wounds ooze a great deal of serum. Do not irrigate the drain tract or remove the drain to insert another. Leave the drain as long as there is a free exudate of

Fig. 3 Suture No. 2 has been tied with the result of coaptating the edges of the hernial orifice. Suture No. 3 is inserted.

serum and remove it gradually as this ceases. Keep the retention sutures tight. At the end of five or seven days they may be tightened up and ten to fourteen days after operation they may be removed.

These patients have no more pain than the average patient after laparotomy. The patients are turned every hour from side to back and to side if not asleep.

An abdominal belt is used in the majority of cases. It is not a necessary part of the treatment but it gives the patients comfort until the muscles resume their normal function. EDWARD L. CORNELL.

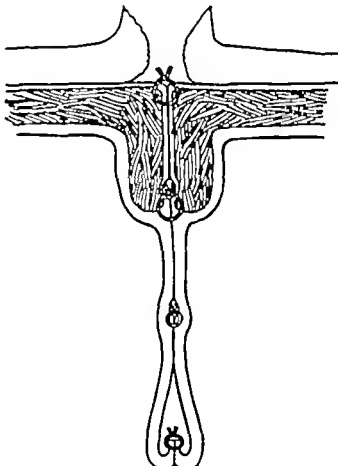


Fig. 4. The inversion of the hernial margins has been completed. The figure-of-eight retention sutures and the skin suture are yet to be inserted.

GASTRO-INTESTINAL TRACT

Richards, W. G. The Alimentary Tract as a Focus of Infection. *J. Lancet* 97 xvi 45

The author believes that while we rightly look for small foci of infection in such organs as the teeth and tonsils as a cause of general disease, we are liable to overlook the potentialities of the bowel itself. He considers that in most cases chronic infections of such organs as the appendix and gall-bladder are really secondary to infections of the bowel, and deprecates the removal of these organs without reference to the underlying source of trouble.

He reviews the function of proteid digestion both enteral and parenteral, pointing out that in conditions of stasis proteid degeneration products may be absorbed from the alimentary tract and produce symptoms comparable to those caused by absorption of toxins from chronic abscesses or sinuses. Local foci of infection while bacteria may penetrate the bowel wall and being carried to other parts may set up metastatic foci. He points out that the keynote of treatment in all these conditions is the establishment of adequate drainage, with removal of the focus, sacrificing the organ involved if functional restoration is impossible, and that in the case of the bowel where medical means fail to re-establish its drainage function, or for any reason is impracticable, the hope of arriving at a solution of the problem of restoring these patients to health lies in thorough study of the new science and art of alimentary orthopedics.

Niles, G. M. The Worth of an Early X-Ray Examination in Gastric Cancer. *M. & R.* 96

According to the author the roentgen ray as an early diagnostic agent in suspected or non-suspected cases of gastric cancer has won a recognized rank. The diagnosis depends upon irregularities of contour caused by the roads of the growth and these areas show an absence of peristaltic waves. Apparent filling defects due to causes other than cancer can usually be eliminated if the proper technique is used. A re-examination on successive days may be necessary in doubtful cases. Emphasis is laid on the fact that a single plate showing a normal filling may carry more diagnostic weight than a dozen which fail to fill.

In the author's experience carcinoma of the stomach near the cardiac orifice is far more insidious than elsewhere; the stomach is rarely attacked until it causes obstructive symptoms referable to the esophagus. Primary cancer in the para-media is a rare entity. Cancer near the pylorus usually causes annular filling defects whose significance is rendered more certain if accompanied by bitten out "notches." Negative findings are of great value only when the examination has been thorough. In conclusion the author insists that every middle-aged individual developing an indiges-

tion which can not be satisfactorily explained by coexisting pathology elsewhere be carefully examined roentgenologically with a view of finding a possible cancer before it reaches the inoperable stage.

ADOLPH HARTUNG.

Reichel. The After Treatment of Gastro-Intestinal Operations (Nachbehandlung nach Magendarmoperationen). *Deutsche Zeitschr. f. Chir.* 96 xxxvii, N. 4

Reichel has changed his views with regard to the feeding of patients after gastro-intestinal operations. He does not now think it desirable to give such patients food as soon as possible as such a course may be harmful rather than beneficial. The early craving for liquid food is met by subcutaneous or intravenous salt infusions and the introduction of water per rectum by the drop method. Solid food is not given before the end of the fifth or sixth day even if the patient shows satisfactory progress.

Regarding the course to be pursued when there are appearances of symptoms which suggest insufficient suturing, the only action according to Reichel which promises success is relaparotomy and exposure of the suture. Perforation due to insufficiency of the suturing does not usually occur before the fifth day. The author cites four cases in support of his views. In 3 of these he obtained recovery owing to prompt radical action in the fourth case the patient might also have been saved if prompt action had been taken.

W. A. DRENNAN

Thomas, T. T. The Support of the Stomach after the Beyer Gastrostomy. *Proc. M. J.* 97 vii

The results in five cases operated on are reported and a short general résumé of the Beyer gastrostomy is given.

In 1800 Beyer reported his first case of gastrostomy although Duval two years previously had brought out his method of suturing the lesser curvature to the parietal peritoneum. Likewise in 1800 Reinling first introduced his procedure of suturing by three rows the anterior surface of the stomach to the peritoneum. In all operations except the Beyer the stomach is suspended from the anterior abdominal wall. Beyer alone depending on a shortening of the gastrophrenic omentum.

Thomas believes the Beyer procedure is the best, as in his opinion it probably gives a better support to the stomach afterward in the best possible situation, but the stomach does not hang entirely by the shortened gastrophrenic omentum. Strong adhesions are formed between the undersurface of the liver and the stomach owing to irritation of these surfaces at the time of operation, and this relieves the gastrophrenic omentum from pronounced strain.

Detailed clinical and operative data in each of the five cases is given.

P. M. CANNON

Rosenthal E.: Case in Which It Was Possible to Follow Roentgenologically the Whole Course of a Stomach Perforation *Berl klin. Wchnschr* 1916 No 34

Rosenthal gives details and illustrations of a case in which by means of roentgen examinations he was able to observe the perforation of a gastric ulcer from the beginning until recovery. He says that no other such case is described in the literature.

The patient was a man of 67 who had suffered from gastric disturbances for 20 years. The first roentgen examination showed a narrow and deep depression in the middle part of the great curvature corresponding to a spastic depression opposite this on the small curvature there was a ulcer about the size of a franc. The point of maximum sensitiveness to pressure corresponded to the showing on the small curvature.

By subsequent clinical evidence and roentgen examination it was demonstrated that the ulcer which was evident at the first examinations had perforated and that the extraventricular shadows observed in the later examinations corresponded to the cavity of perforation.

The course of the case was followed by roentgen examinations at intervals of eight to ten days until the patient had fully recovered from all objective symptoms. W. A. BRECKMAN

Scudder G. L. and Harvey S. G.: Is the Employment of the Actual Cautery in the Treatment of Chronic Ulcer of the Stomach a Safe Procedure? *Surg Gynec & Obst* 9:6 Jan 7:9.

The authors report the results of animal experimentation in order to determine the difference if any in the reparative processes following the use of the actual cautery in chronic gastric ulcers as against excision with the knife.

Ten full grown, healthy dogs were used in the experiment. The cautery was used at intense red heat and was carried slowly through the entire stomach wall. The knife was used to incise the layers down to the mucosa which was divided with scissors. Similar methods of closure were used in all.

The conclusions from the several experiments are (1) The amount of tissue injured by the cautery is but slightly greater than that following the knife as shown by the condition of the mucosa and submucosa in each instance. (2) There is no marked difference in the rapidity of repair. (3) Suture of the cauterized margins is attended by practically a normal reparative process. (4) The cautery is applicable to those cases of chronic ulcer in which excision is difficult and after removal of the area the edges should be approximated by suture. (5) This method may be used with safety in ulcers of the posterior wall of the stomach which are adherent to the posterior parietes or pancreas. (6) The cautery will destroy beginning malignancy of the ulcer site. (7) The method saves time and does not produce an excessive loss of stomach tissue.

P. M. CHASE.

Stewart G. D. and Barber W. H.: Segmental Resection for Gastric Ulcer. *J. N. Surg. Phila.* 1916 LX 5:7

The authors, in a tentative report seek to determine if possible whether resection of the ulcer bearing segment or the removal merely of the ulcerous site leaves the stomach with the better post operative motility. This study was based upon the operative results of four cases and the experimental results in a series of 21 dogs.

Attention has recently been called by Moynihan, von Eiselsberg and Mayo to the fact that following certain operations on the stomach, especially resections considerable functional impairment appears. W. J. Mayo has lately declared on the other hand that the sleeve or the segmental resection gives an excellent permanent result.

Briefly the indication for segmental gastrectomy is the large calloused ulceration. The technique consists in removing a segment of the stomach containing the lesion and in uniting terminally the divided ends.

The clinical and operative histories of the four cases including X-ray plates are given and a brief review of the known muscle physiology of the normal stomach as regards the character power and time of the contractions.

In the experiments on dogs, 10 were examined postmortem after two weeks to two months of postoperative life. Of these 3 were triangularly and 7 segmentally resected. Of the former 2 stomachs were found to be moderately dilated and 1 markedly. Of the latter 4 were found to be normal, 2 moderately dilated and 1 slightly. Further in the former the times of prostatic waves were 8.0 and 14.7 seconds respectively in the latter 21.7 and 11.4 seconds respectively.

Before closure of the abdomen it was demonstrated that in the stomachs of those animals with triangular resections the waves seemed slower shorter and much less distinct than in those where segmental resection was done.

In 8 dogs tracings of intragastric pressure were taken following Carlson's technique. Under exactly similar conditions it was observed that the stomachs of those segmentally resected showed forcible contractions and tonus changes while those triangularly resected generally did not. Both however showed continuous rhythm.

Roentgenographical descriptions are given of 1 normal and 2 pathological dogs and 4 pathological human cases.

The authors tentative conclusions are

1. W. J. Mayo's report or implication that the sleeve resection is followed by good motility seems to be borne out certainly in so far as the proximal segment is concerned and apparently in respect to the distal one.

2. While segmentally resected stomachs have not emptied quite so effectively as normal ones still the results have been more satisfactory than in those with triangular resection.

3 This difference is probably due in great part to the fundamental disturbances in the neuromuscular motor mechanisms of the stomach.

P. M. CHASE

Frank, J. Observations on the Surgical Treatment of Gastric and Duodenal Ulcer; Including a Brief Review of Recent Literature. *Am J Surg* 91 385

The author includes a brief review of the recent literature and quotes Paterson's statement that gastro-enterostomy cures 92 per cent of ulcers also that in the Mayo Clinic 71 per cent of duodenal, and 67 per cent of gastric ulcers were cured and 94 per cent of duodenal ulcers and 91 per cent of gastric ulcers were cured or greatly benefited. Woolsey claims that gastro-enterostomy was successful in 8 per cent of cases. The latter employed three methods of excluding the duodenum: (1) von Eiselsberg's proximal division and suture; (2) Wilms' method of pyloric exclusion; and (3) infolding the pylorus by a suture.

Ulcers of the terminal inch and a half of the stomach are very apt to be mistaken for carcinoma because of the palpable inflexion due to edema and muscular hypertrophy.

Hemorrhage from gastric ulcer is more frequent than in duodenal ulcer and more serious.

The author quotes Ochsner's conclusions:

I. All of the recent early cancers counted the growth was located in the edge of the ulcer. By careful study of the history of late cancer in which the original ulcer had of course been obliterated by the growth it was possible to elicit a previous ulcer history.

3. In studying the development of cancers in other parts of the body a point usually so difficult which has been subjected to long continued irritation as in the lip, foot, rectum or uterus.

4. The fact that there are so few cancers of the duodenum as compared with the stomach may be explained by the fact that while there is stenosis of the stomach the contents in the duodenum in other words while food containing cancer germs will remain in contact with gastric ulcer sufficiently long to permit the germs to become implanted this is not the case with the duodenum.

5. It is possible that these germs may require an acid medium to stimulate them to attack the tissues.

6. It is relatively an easy matter to overlook the history of a previous gastric ulcer because in the absence of severe hyperacidity the pain in these cases is frequently insufficient to be remembered through the great distress from which the patient suffers after the cancer has developed.

7. It is usually found that a large majority of these patients have habitually eaten large quantities of food which was certainly infected with murex such as lettuce, celery, radishes, etc., so the introduction of the cancer germ into the open wound of the ulcer could be easily explained.

8. These gastric ulcers are of such long duration that the focus of irritation might readily serve to locate cancer germs which might have entered the circulation through some other portal.

9. This does not indicate that every patient who has an ulcer of the stomach will ultimately have cancer any more than that every soldier going to war will be shot but it shows the wisdom of closing this opening for the entrance of cancer by curing the ulcer early and permanently.

10. Much attention should be given to the early history of these cases and to the prevention of eating unclean, uncooked food.

Wilso found that 60 per cent of the cases of gastric carcinoma developed on the base of chronic ulcer and clinically 60 per cent of the cases of cancer gave a previous history of gastric ulcer 43 per cent a typical history of ulcer and 18 per cent a history of gastric irregularity.

The presence of complications and the degree of glandular implication has a great bearing upon the exact type of procedure in gastric and duodenal surgery. Without doubt chronic gastric ulcer represents a stage in the development of carcinoma and although glandular involvement does not always indicate carcinoma it certainly should be considered a suspicious factor in deciding upon the appropriate operative procedure.

The possible sequelae of gastro-enterostomy are: (1) acute gastric dilatation, (2) the establishment of so-called vicious circle, (3) postoperative bleeding from perforation of the sutures, (4) the occurrence of sepsis, (5) the development of jejunal and peptic ulcers, (6) recurrence of the ulcer with secondary strictures, (7) wound rupture with hernia.

The author believes that in many instances a two-stage operation will be followed by better results than if too much is attempted at one sitting.

C. G. HAYD

Loehr, W. End Results of Operatively Treated Gastric Ulcers (13 years' post-operative behavior of 100 ulcers). *Deutsch. Zeits. f. Ch.* 96, Nos. 1 and 2.

Loehr discusses 63 gastric ulcer operations. Of these cases 9 were in men and 72 in women. There were 47 cases of callous ulcer, 39 simple ulcers with perigastritis, 43 cicatricial ulcers with adhesions, etc., 22 perforating ulcers, 6 fresh bleeding ulcers, 6 hour-glass stomach cases.

The end-results in the 129 patients of the first three categories (callous simple and cicatricial ulcers) showed 1 death, 78 good and 30 unfavorable results. The diagnosis was wrong in 6 cases. There were 4 carcinomatous results observed within two years after operation. The best end results were observed in cases where the ulcer was situated in the pylorus. An ulcer which is operated on already carcinomatous very rarely becomes so later on. The possibility and frequency of wrong diagnosis renders the prognosis in individual cases more doubtful than the possibility of a cancer de-

veloping secondarily upon the ulcer. In hour-glass stomach cases half of the end results are good but in the other half the recoveries are not complete. In 6 cases of profuse gastric hemorrhage treated surgically a good result was observed in 1 case only. Of the 22 patients with perforated ulcers 10 died as a result of the operation. In 8 of these multiple gastric ulcers were found at autopsy. Eight of these patients show a good operative end result. One patient died a year later subsequent to a further perforation.

W. A. BRENNAN

Gerlach, W., und Erckes, F. Roentgen Diagnosis of Duodenal Ulcer (Roentgen-untersuchung bei Ulcus duodeni) *Deutsche Ztschr. f. Chir.* 1916 cxxxvi, Nos. 4 and 5

The authors' radiologic studies are based upon their experience in 47 cases operated in the Bier clinic. There are only two symptoms which appear with any remarkable frequency: high degree peristalsis and dilatation often joined with ptosis. These are observed respectively in 62 and 68 per cent of the cases. Critically however these would perhaps not be admitted as symptoms and as a matter of fact there is no single roentgenological symptom which might indicate the diagnosis of ulcer duodeni. A roentgen examination is however, valuable because duodenal ulcer can be excluded if a stomach lesion can be shown with certainty.

W. A. BRENNAN

Miller, R. T. Retroperitoneal Rupture of the Duodenum by Blunt Force. *Ann. S. & Phila.* 1916 lvi, 55

The author reviews the subject of retroperitoneal rupture of the duodenum by force insufficient to cause injury to the abdominal wall, reviews the cases reported in the literature and cites one of his own.

The injuries are usually produced by crushing of the bowel against the spine, hursting by increased internal pressure within a loop whose ends are momentarily closed, or tearing of the bowel at a point between a fixed and relative free section of the gut.

Rupture of the duodenum forms about 10 per cent of these injuries and fully 25 per cent of these are retroperitoneal. This particular lesion has a mortality of 90 per cent due no doubt to the obscurity of the lesion. In a series of 37 reported operations by competent surgeons the lesion was missed 13 times.

The case reported was that of a miner aged 21 with an unimportant previous history. Three days previous he had been kicked by a mule in the right side but not felled. Several hours later he began to complain of general abdominal pain, some nausea and vomiting. The pain had been continuous ever since.

Examination showed a temperature per rectum of 101, pulse 80, respirations 32 — chest negative. The abdomen showed no external signs of injury, moderate distention, no masses nor peristalsis.

there was slight tenderness and rigidity most marked in the right upper quadrant, there was acute tenderness below the twelfth rib on the right side of the back.

The patient did not seem ill nor in great pain, but as the leucocyte count was subnormal, he was put under observation.

Seven days later his temperature had fallen to nearly normal, the leucocytes remained the same but there had been two attacks of vomiting, peristalsis was visible in the upper abdomen left to right and the facies less bright. Operation was advised.

At operation the peritoneal cavity was found clean but behind the first and second portions of the duodenum was a large retroperitoneal abscess, a perforation was found on the posterior aspect of the superior half of the second portion of the duodenum.

The patient's condition becoming urgent drainage alone was done, but death occurred within a short time. Autopsy confirmed the diagnosis of retroperitoneal rupture of the duodenum.

The points of interest in this case were the slight general and local reaction from the abscess, due no doubt to the relative sterility of the duodenal contents, and the point of tenderness beneath the twelfth rib.

The review of retroperitoneal ruptures of the duodenum is based on a series of 22 cases.

This injury is peculiar to the active working male, the average age being 24, and is always due to trauma.

In the series, 82 per cent were situated in the second or third portions of the duodenum. Most commonly the lesion is punctate although frequently circumferential and there is no sign of necrosis of the subjacent bowel wall such as would be present if the lesion were due to secondary sloughing.

Of the 22 cases, 15 showed retroperitoneal extravasations at operation. This is always found either in the root of the transverse mesocolon in the root of the mesentery of the small bowel or involving in addition, the intervening retroperitoneal space and is usually of rapid formation. The content is a bloody bile-stained fluid mixed with gas that soon becomes purulent.

The peritoneal cavity is clean or at best contains a very small amount of free blood-stained fluid probably from a minute injury to some viscera. Likewise there frequently are multiple petechial subperitoneal hemorrhages scattered over the ascending and transverse colon, omentum and mesentery. Fat necrosis was observed in three cases only.

These findings are to be considered pathognomonic.

Regarding subsequent peritonitis it is undoubtedly delayed for some time by the intact peritoneum but ultimately occurs.

With these symptoms there may appear a fixed tumor in the upper right quadrant, this being noted in 2 cases of the series.

Of the 22 cases 20 were operated on and but 3 re-

covered. No case survived when operation was postponed longer than twenty-four hours.

In the surgical treatment elaborate procedures should be tabooed simple suture sufficing when possible. If the gut is badly torn above the papilla the operation of choice is closure of the ends and a posterior gastroenterostomy. In the third portion of the gut it would be best to resect and do a retrocolic duodenojejunostomy.

As regards methods of approach Kocher's mobilization is best suited for the first and second parts of the duodenum. The other two parts are exposed by raising the transverse mesocolon and incising the peritoneum at the base of the posterior leaflet care being taken to avoid the right and middle colic arteries. The authors' conclusions are:

Subcutaneous rupture of the duodenum forms 10 per cent more of the total number of subcutaneous ruptures of the bowel.

About one-third of the subcutaneous ruptures of the duodenum occur in its retroperitoneal portion and do not communicate with the peritoneal cavity as a result of the primary injury.

In one third of the reported cases the lesion was not recognized at operation though operation was undertaken on diagnosis of probable rupture of the bowel. In contrast to this stands the fact that the findings at operation are distinct and practically pathognomonic.

The presence of retroperitoneal hemorrhagic extravasation occupying the root of the transverse mesocolon and more or less of the adjacent region with peritoneal cavity which is grossly clean is practically pathognomonic of traumatic retroperitoneal rupture of the duodenum and with the presence of subperitoneal petechial hemorrhages and fat necroses over the ascending colon, transverse colon and mesocolon presents a typical picture.

There is a mortality of 90 per cent or more in this group of cases as contrasted with an estimated mortality of 10 per cent in a subcutaneous rupture of the bowel in general.

The symptoms of such a rupture differ from those of intraperitoneal rupture very slightly except that the onset of severe symptoms is slower.

In the fatal cases extensive retroperitoneal extravasation is constant and together with the effects of duodenal fistula and toxemia is in part responsible for the mortality rate. P. M. C.

Eaton E. Chronic and Progressive Intestinal Occlusion by Submucous Fibromyxoma of the Small Intestine. Enterectomy and Circular Enterorrhaphy Recovery. (Occlusion testicule chronique et progressive par fibrome sous-muqueux de l'intestin grêle entraînant l'entérorrhaphie circulatoire guérison.) *Bull. et mém. Soc. Ch. et Par.* 9 6 12 46.

Eaton reports this case not only on account of the rarity of benign tumors of the small intestine with a histological examination but also on account of the diagnostic difficulty the symptoms giving rather the impression of appendicitis than of occlusion.

The patient was a woman of 53 and the diagnosis was chronic appendicitis. On opening the peritoneum a loop of small intestine was found much dilated. One part was indurated which gave the sensation of a coelium causing the intestinal occlusion. The indurated part was largely excised as well as the triangle of the corresponding mesentery. A circular enterorrhaphy was done successfully.

The removed tumor was hemispherical in shape and was 4 cm in diameter. It was implanted in the intestinal wall about a fingerbreadth beyond the mesenteric insertion and with a large pedicle.

Microscopically the tumor was shown to be a myxofibroma which in its superficial part approached the histologic type of pure myxoma; the basal part showed the structure of diffuse fibromyxoma. The coelium had progressively invaded the mucosa, which had disappeared, except in the vicinity of the pedicle. About its point of implantation it had separated and destroyed the muscular intestinal coatings.

W. A. BROWN

Abadie. Intestinal Occlusion Due to a Diaphragmatic Hernia of the Colon Resulting from an Old Penetrating Thoraco-abdominal Wound. (Occlusion intestinale par hernie diaphragmatique d'ancien type d'une plaie pénétrante thoraco-abdominale ancienne.) *Presse méd.* 9 6 p. 557.

In the case reported a man was wounded by a piece of shell which entered about the level of the eighth left rib. He was operated upon five months later for epigastric hernia. Seven months later he entered the hospital with symptoms of acute intestinal occlusion. On median laparotomy a total evulsion was shown that the marked distention of the intestinal mass was arrested at the splenic angle of the colon. A left transverse branch incision was added to the first incision; the splenic angle and two-thirds of the epiploon were found strangulated in diaphragmatic orifice front of the cardia. The mass was freed; part of the epiploon being adherent. The diaphragmatic breach was closed, the thoracic cavity being aspirated. The large curvature of the stomach and transverse colon was sutured in order to re-establish the normal position of the viscera. The patient however succumbed to pyæmia twelve hours after operation.

The author thinks that the case demonstrates that we cannot be too reserved in prognosis with regard to penetrating thoraco-abdominal wounds which have had spontaneous recovery. Such patients should be carefully examined and watched for symptoms of hernia; a radioscopic examination will facilitate the diagnosis. W. A. BROWN

Lynch J. M. and Draper J. W. Consideration of the Intestinal Toxemias from the Standpoint of Physiological Surgery. *Med. Rec.* 9 6 909.

The authors hold that the word stasis is unfortunate in that it implies mechanical rather than biochemical or physiological consideration.

The diagnosis of adult intestinal toxæmia has its basis in the cardinal symptoms of diarrhoea and constipation. The authors believe that these are to be looked upon as due to an exogenous cause until proved to be endogenous. In their experience failure of fusion and departure from the normal migration of the cæcocolon plays a more important part than the acquired conditions. The common mesenteric which results from non fusion may permit of 180 degrees mesodorsal rotation upon adventitious bands giving a deformity with intermittent partial obstruction.

The authors consider what applied surgery can do for intestinal toxæmia. Procedures that have been in general use have been (1) ileosigmoidostomy (2) cæcosigmoidostomy (3) appendicostomy, (4) ileostomy (5) plication of the cæcocolon and repair of the cæcal valve (6) total colonic exclusion (7) colectomy (8) developmental reconstruction of right ileocolostomy.

Ileosigmoidostomy has undoubtedly benefited a number of cases but the authors refer to the dominant anastalsis as the basis for the symptom constipation and refer to the 10 per cent of cases in which a subsequent colectomy is necessary as a corrective measure.

The authors object to cæcosigmoidostomy as running counter to the physiological law that in intestinal contents tend to follow the normal direction of the canal, irrespective of lateral stomata, with the production of a vicious circle.

The conclusions are

1. Appendicostomy is safe but insufficient.
2. Ileostomy has limited but definite indications.
3. Plication of the cæcocolon is of questionable benefit.
4. Strauss' total colonic exclusion is a new operation.

5. Colectomy has a place but a small one. The authors would reserve colectomy for diffuse polyposis, papillomatosis, diverticulitis and certain malignant tumors.

The authors have applied the term developmental reconstruction to the ordinary operation of resection of the terminal ileum the cæcocolon and the oral part of the transverse colon believing that thereby the colon is reconstructed to the primitive or developmental type as seen in the adult dog or in the human foetus just before rotation, the great gut beginning in the right hypogastrium and there being no true cæcum or ascending colon.

Colonic vaccines have a place in the postoperative treatment as has the rectal feeding of amino-acids.

C G Heyd

Kuroda, M: Observations of the Effects of Drugs on the Ileocolic Sphincter. *J. Ph.armacol. & Exp. Therap.* 916: 1-87.

As the author points out it has been shown that the ileocolic sphincter differs essentially from the rest of the intestine in its reaction to stimulation of the splanchnic or adrenalin injection, both of which increase the movement of the sphincter while

inhibiting that of the small intestine proper and also that the augmentor action of adrenalin on the sphincter was absent after the injection of large doses of ergotoxin but he states that so far as he is aware no further work has been done on the reaction of the sphincter to drugs, nor is it known whether the contrast between the effects on the sphincter and the rest of the bowel which is so marked in the case of adrenalin extends to other poisons. He has attempted therefore to fill this gap in part by examining the action of atropine pilocarpine nicotine and cocaine on the ileocolic sphincter of the cat with the following results.

1. Adrenalin distinctly contracted the ileocolic sphincter of the cat even in a small dose and not only that of the intact animal but also the surviving sphincter while the small intestine was relaxed and its movements arrested.

2. Pilocarpine exaggerated the tone of the sphincter greatly and increased its movement as in the small intestine.

3. Atropine acted similarly on the sphincter and the small intestine i.e. a very small quantity of it did not act on the normal organs while moderate and large doses (from 5 to 40 mg. in a cat 2 to 4 kilo weight) caused augmented tone and movements. Very small quantities of atropine arrested the contractions caused by pilocarpine.

4. Cocaine increased the tone of the sphincter and had a tendency to cause spontaneous movements.

5. Nicotine caused marked relaxation of the surviving sphincter in the first stage and the normal movements then returned. The balloon method carried out on the sphincter and the small intestine showed no difference between them both undergoing strong contractions followed by inhibition and relaxation and finally returning to their normal activity.

6. The effects of atropine pilocarpine nicotine and cocaine on the sphincter were very similar to those on the intestine in general. Yet the innervation of the sphincter was entirely different from that of the intestine in which the vagus was the augmentor the splanchnic the depressor nerve, while in the sphincter the splanchnic was the augmentor and no inhibitory nerve was shown to exist.

The correspondence in the action of these drugs on parts which are so different suggested strongly to the author that the seat of their activity is not the nervous apparatus but the muscular. And this view is strengthened by the fact that adrenalin has an action on the sphincter opposite from that in the intestine in general, thus changing along with the character of the nervous activity.

GEORGE E. REID

Jennings, J. E.: The Origin and Course of Chronic Perityphilitis. *Long Isl. Med. J.* 1916, 2, 521.

Chronic perityphilitis, as defined by the author is a process characterized by the presence of suppurative areas of congestion inflammation and cicatrization.

trical retraction accompanied by disturbances of ileocolic function by catarrhal and croupous inflammation of the cecum and ascending colon, sometimes initiating a descending colitis and pericolicitis. The cases are those in which the symptoms supposed to be due to a chronic inflammation of the appendix, persist after removal of that organ.

Various authorities in France Germany and America have recognized this condition for some time past and in reviewing the literature the consensus of opinion seems to implicate the frequent folds and membranes (Jackson, Treves, Lane's link, etc.) as prominent causative factors. The real sources of the necrosis are however in the appendix, terminal ileum, or ileocolic glands. These latter glands are most frequently involved as a sequel of tonsillitis. On the third or fourth day abdominal pain and vomiting occur but with the tenderness localized much higher and nearer the navel than is usual in appendicitis. The majority of cases will subside without operation.

The condition of stercolal typhlitis is probably an extension of the caecal condition either within the colon directly or by subperitoneal process round the pelvic brim apparently advancing with the congestion of each menstrual period.

Again, there may be variety that originating around the gall bladder descends and involves the parietocolic and omentocolic folds.

The condition should be suspected in cases of long-standing intermittent right iliac pain usually accompanied by dyspepsia and in those cases of dysmenorrhea in young unmarried women accompanied by right-sided pain between periods and general disturbance of digestion.

The treatment consists in appendectomy with thorough investigation of all bands and veils. If these show diseased conditions accompanied by caecal dilatation they must be severed and the cecum anchored to the parietal peritoneum. Enlarged ileocolic glands should be carefully dissected out.

If the disease is of long standing especially if colitis has become evident and the colon is bound down, it is better to excise the cecum and ascending colon and anastomose the ileum to the transverse.

In those cases of long-standing condition and much red ed, with marked mucomembranous colitis, appendectomy ileosigmoidostomy and colon resection should be attempted in consecutive stages.

P. M. CHASE.

Shattock, S. G. The Traumatic Causation of Appendicitis. *Proc. R. Soc. Med.* 1916 1. *Pathol. Sect.* 3.

The results of experiments instituted with the object of test a certain view which have been put forward in explanation of the alleged increase of appendicitis are recorded together with the descriptions of a series of appendicular and intestinal concretions and observations upon appendicular pigmentation.

The traumatic agent must conform to the propositions that (1) it must be widespread and extend to all classes of the community, and (2) must be of comparatively recent introduction. Silica which is used extensively in enamelled hardware and which flakes off in working silica in the form of minute particleshipped from stone in stone milled flour and steel or iron particles chipped from the rollers in the more modern flour mills all agree to the premises.

Evidence from mining districts, cement workers, and other workers where silica may be inhaled shows that appendicitis is no more prevalent than among other workers. Three experiments are quoted in detail showing that various samples of stone milled flour contained no foreign material or residue. Regarding the French chalk of the dentifrices, it is shown that while incapable of producing mechanical injury the chalk might theoretically serve as the starting point of a concretion. As for the insoluble magnesium phosphates of Crebos salt, this is readily dissolved by the gastric juice.

It is assumed that there may be particles of steel in the flour. Several experiments are detailed showing that these particles will retain their original characteristics for an indefinite period in properly stored flour. Other experiments are given showing that these particles undergo only superficial oxidation when the flour is baked into loaves. In the stomach it is shown that the gastric juice acts very slightly on these particles forming ferrous chloride and hence any resulting intestinal stasis would be negligible. Again, after citing many experiments in detail, it is shown that there is positively no change of the particles in the small intestines. In the large intestine through the action of the hydrogen sulphide ferrous sulphide is formed on the surface of the particles. This accounts for the blackening of the feces following iron administration.

Regarding the pigmentation of the appendicular mucosa numerous experiments show that it is arranged within the cells in globules, that there is no iron present and that it resembles in all particulars blood pigmentation such as is found in other sites. Descriptions are given of the different appendices studied and the microscopical characteristics of different metallic sulphides.

Eleven cases of foreign body in the appendix exclusive of concretions are noted.

Detailed descriptions are given of various intestinal concretions such as enteroliths coproliths, and stercoliths, all found in humans. In humans the concretions resulting from accumulation of cat hairs most nearly resemble those above true enteroliths, however are very rare. Detailed descriptions of specimens studied are given.

Appendicular concretions are either enteroliths or stercoliths, the former being very rare. As a rule, the concretion is either stercolith or a mixture of the two. Follows then descriptions of specimens,

and observations upon their multiplicity articulation fractures and their central nucleus. Twelve specimens of nuclei are described. P M CHASE.

Graves S.: Cystic Dilatation of the Vermiform Appendix. *Ann Surg Phila.* 1916 lvi 587

As cystic dilatation of the appendix is of fairly rare occurrence the author reports the following case.

The patient was a white male 21 years of age with a history of five typical attacks of appendicitis during the previous three years. At operation, a large cystic appendix free from adhesions and with a short cord like base was removed. The dimensions were 16.5 cm. in length by 3.5 cm. in diameter.

The microscopic diagnosis was (1) pedicle healed obliterated appendix (2) wall compressed appendix wall with slight chronic inflammation.

The process, evidently inflammatory obliterated the proximal segment and the mucous membrane of the distal segment continuing to secrete formed the cyst. It was interesting to note the lack of perianal adhesions. P M CHASE.

Dupont: Extraperitoneal Wounds of the Ascending Colon. Section of Crural Nerve at Its Roots; Suture of the Colon (Plaies extra-péritonéales du colon ascendant section du crural au niveau des racines sutures du colon). *Presse méd* 1916 p 557.

Dupont cites the case of a soldier who was wounded by a shell fragment in the right flank. There was no immobilization of the diaphragm. Intervention was made by the lateral route following the trajectory of the projectile which was found in the psoas at the level of the sacro-iliac angle. The ascending colon was largely perforated in three places. Each perforation was sutured in two places with silk. The crural nerve was sectioned at the roots and could not be sutured. The roots were dragged rather than sectioned and it was impossible to reattach the lower end to any appreciable nerve filament. The man recovered perfectly except that there was a marked atrophy of the quadriceps.

The author calls attention to these three points (1) the absence of immobilization of the diaphragm which has obviated intraperitoneal lesions (2) the special disposition of the ascending colon which was almost entirely extraperitoneal (3) the advantage in cases of lateral abdominal wounds of not making a median laparotomy but always to operate by the lateral route and follow the trajectory of the projectile. If the suturing cannot be quite assured by the lateral route a median laparotomy can be done later. W A BRECKMAN.

Gant S G: Causation and Treatment of Idiopathic, Operative and Postoperative Anorectal Hemorrhage. *N Y St J Med* 1916 xvi, 580.

Bleeding from the rectum may be slight, moderate or alarming and evacuated blood may be bright red or black in color or having the appearance of coffee-grounds. Rectal hemorrhage rarely occurs

except accidentally. Postoperative hemorrhage is rarely dangerous but causes anemia and may be external (visible) or internal (concealed).

External hemorrhage complicates lower rectal and internal, sigmoid and colonic lesions. Anorectal hemorrhage may be primary, recurrent or secondary. Secondary bleeding is usually venous and occurs several days after operation as a result of infection sloughing or cutting out of ligatures.

Primary, recurrent, secondary or late hemorrhage may be insignificant or serious either of which is quickly controlled by an experienced proctologist. Anorectal hemorrhages may be induced accidentally by the passage of foreign bodies or by the following lesions named in the order of their importance: (1) internal hemorrhoids (2) proctitis (3) fissure in ano (4) ulceration (5) constipation and fecal impaction (6) cancer (7) polyps (8) stricture, (9) capillary varicosities (10) hemorrhagic proctitis, (11) procidentia recti (12) cryptitis (13) condylomata (14) fistula (15) villous tumors (16) diverticula (17) invagination of the sigmoid flexure into the rectum and (18) miscellaneous affections.

Usually profuse bleeding results from a careless technique or faulty postoperative treatment.

In regard to symptoms and indications of hemorrhage, blood in the feces or upon the dressings points to bleeding but the cardinal indications of alarming rectal hemorrhage are restlessness, thready pulse, clammy perspiration, pallor or syncope, irresistible desire to stool, abdominal distention with colicky pains from the accumulation of blood-clots, gas in the large bowel and coffee ground like evacuations when blood is retained and large liver like clots or pure blood when hemorrhage is recent or active as a result of lesions or wounds in the lower rectum.

Hemorrhage from ulceration is arrested by ichthylol or balsam of Peru, 2 per cent irrigations, silver nitrate 6 per cent applications which heal ulcers.

Active, alarming anorectal hemorrhage is readily controlled by (1) placing a Gant pyramidal compress to the anus, (2) ligating bleeding vessels (3) a running catgut suture (4) packing the anal canal with a condom distended with gauze (5) clamping the tissues with pressure forceps left *in situ* (6) distending the rectum with an inflatable bag (7) cauterizing oozing surfaces and distending the anal canal with sterilized gauze.

Styptics are useless but pressure properly exerted always controls rectal bleeding. The employment of strychnia, digitalis or saline injections into veins cannot be relied upon and often aggravates bleeding because they tend to dislodge partly formed clots by increasing blood pressure.

Stincer E.: Complete Absence of the Anus (Anus completa d'ano). *Rev de méd v cin g* Habana, 1917 xii 33.

Stincer reports a case of complete occlusion of both the urinary and digestive outlets in an infant twenty-four hours old. There were no abnormal

communications and no fistulae so that instant intervention was demanded. The intervention was made by the perineal route under novocaine anesthesia. A median perineal incision 3 cm. long was made, followed by cautious dissection of the constitutive planes of the region directed toward the anterior face of the sacrum and avoiding injury to the bladder. There was no appearance of a rectum, but a bluish obscure mass was seen which was thought to be the rectum. This was found to be the rectal ampulla and after being isolated from the surrounding structures was carefully mobilized and drawn to the perineal surface. The ampulla was incised and its edges sutured to the lips of the perineal surface wound. Meconium was expelled by the intestine in great quantity. The rectum evacuated its contents. The infant was circumcised which completely re-established the interrupted miction. After ten days the child left the author's service in perfect condition. W. A. BARKER.

LIVER, PANCREAS, AND SPLEEN

Ferrannini A. Contribution to the Diagnosis of Malignant Liver Tumors (Contributo alla diagnosi dei tumori maligni del fegato). *Riforma medica* 96 20

Among the cases of liver tumor which Ferrannini had occasion to study during the last five years there were three in which the diagnosis of malignancy was confirmed in one case by autopsy in one by surgical biopsy and the third by exploratory puncture. His present article is a detailed study of the symptomatology and findings in these three cases. He affirms that on the exclusion of certain symptoms the diagnosis may still be doubtful as between hydatid cyst and malignant tumor of the liver. In such cases these factors will decide the diagnosis in favor of malignant tumor: the patient's age if above 50 years or only slightly under the marked and rather sudden liver enlargement, the multiplicity and induration of the tumors which are felt in the liver, the presence of eosinophils and even generally of leucocytosis, the continuous presence of grave disturbances of the hepatic function especially by the scarcity of urea and a very high degree of urobilinuria, the coexistence of a gastric syndrome analogous to that of gastric carcinoma observable even if the stomach is free from this condition. Malignant liver tumors are more likely to be sarcomatous than carcinomatous when the liver enlargement is of a very high degree and when there is a clear presence of extra-abdominal metastases, ascites, and especially of icterus. W. A. BARKER.

McArthur L. L. The Value of Temporary Cholecystostomy in Gastric Surgery. *Lawrence* 96 xxxvii 73

The author points out the value of a temporary cholecystostomy in gastric surgery using this route for introducing distal to the stomach, such fluids as may be indicated. The beneficial results are

attributed to the great power the upper intestinal tract has for absorbing fluids. This in turn stimulates peristalsis, overcoming splanchnic stagnation, resulting in a freedom from or relief from those annoying postoperative sequelae vomiting, vicarious diuresis, shock, and anuria.

The biliary fistula is formed by means of a purse string suture, inverting the serous surface of the fundus of the gall bladder around a rubber tube, and bringing the latter out of the abdomen through a stab wound. Fluid is allowed to flow into this tube by gravity from an elevation of from 12 to 30 inches at a rate of from 5 to 10 drops per second.

The biliary fistula may be established in the common duct, and in that case the tube is inserted through the duct well into the duodenum.

Attention is called to the inability of either the cystic or common duct to stand any but neutral or slightly alkaline fluids and of a density not greater than that of the blood serum or bile. Among the fluids suggested as appropriate for various conditions are hot hypotonic solution, mildly alkaline salt solution containing a physiological dose of adrenalin for shock, where food is required a 2 per cent dextrose solution combined or not with any desired liquid peptones. Itabers for acidosis, etc.

D. L. DIXON.

Matheny A. R. Cholecystectomy: the Operation of Choire. *P. M. J.* 95, 27, 95.

The author gives a general résumé of the operation of cholecystectomy with several of the more important points in the technique.

J. B. Murphy first advanced the idea, that the gall-bladder act as pressure chamber to equalize the pressure in the hepatic common, and cystic ducts thereby preventing regurgitation into the hepatoduodenal. Chronic cholecystitis will prevent this by so affecting the bladder walls as to prevent proper expansion or contraction. Likewise Charles Mayo has shown that the gastric symptoms are not due to the stones but to the infection. Roseow believes that gall-stones are merely a symptom of previous gall bladder disease and that this organ once diseased remains either a nidus of infection or loses its function.

The mortality of the Mayo, Deaver, Ochsner and others in cholecystectomy is no greater than that in cholecystostomy.

Good exposure is the prime essential. The author favors the incision used by Judd, i. e. beginning at the umbilum and extending to a point two inches to the right of the umbilicus. Adhesions are freed as in cholecystostomy.

The chief dangers at the time of operation are injury to the common, or hepatic ducts and the portal vein. Where separate ligation is impossible, a clamp may be left on the stump as in nephrectomy for thirty-six to forty-eight hours. Upon removal drainage is instituted. In distinguishing the common duct the method of Terrier is recommended.

Follow up records from different operators show

the results of cholecystostomy to be 50 per cent cured and 25 per cent improved cholecystectomy 75 per cent cured and 15 per cent improved.

The author however believes that cholecystostomy should be used in acute empyema or virulent infective cholecystitis or when the patient's condition demands merely an emergency operation. He is also of the opinion that the gall bladder if in such condition as to require any operation at all should be removed except in the small percentage of cases mentioned.

P. M. CHASE.

Evans, F. A.: Reaction of the Spleen in Acute Infections. *Bull. Johns Hopkins Hosp.* 1916 xxvii, 356.

It has been the object of this study to interpret the histology of acute splenic tumor as seen at autopsy on the basis of what is already known of the cells in the spleen and to control these interpretations by experimentally induced acute splenic tumor in animals under various conditions.

The author first considers the histology of the spleen and presents a study of autopsy material from the two types of acute splenic tumor which he designates the red and the gray. He found all his acute splenic tumors due to infections to be of one or the other of these types. He considers each type in detail. He then presents the results of his experiments on rabbits and also presents a study of the associated changes in the bone-marrow and as a result of his study and experiments he draws the following conclusions.

Although this analysis of the histopathology of acute splenic tumor is based upon somewhat fragmentary knowledge of the cellular content of the spleen. It brings further proof that a separation of the vitally staining histogenous macrophages and the endothelial cells from the other cells of the mature organism is justified functionally although not always possible on morphological grounds and that the spleen is an integral part of the blood system of the body responding quickly to any influence inhibiting or stimulating hematopoietic activity. And in regard to the reaction of the spleen in the commoner acute infections it may be said that:

1. Acute splenic tumors all fall into one or two major groups: the red type associated with typhoid fever and closely related infections, and the gray type with pneumococcus, staphylococcus streptococcus, and other infections.

2. The spleen in each type of acute splenic tumor shows active congestion upon the extent of which depends the size, consistence and in large part the color of the organ.

3. The histological picture of red acute splenic tumor is distinctively characterized by hyperplasia and activity as evidenced by phagocytosis of the reticulo-endothelial macrophages and decrease in number of the other cells of the pulp and these changes are dependent on a toxic inhibition of the leucopoietic functions of the body associated with

typhoid fever and a stimulation perhaps functional, of the reticular and endothelial cells.

4. The histological picture of gray acute splenic tumor is distinctively characterized by an increase in the pulp cells, especially the oxydase-containing myeloid elements, without any proliferation or increased activity of the reticular and endothelial cells and these changes result for the most part from a functional demand for leucocytes.

GEORGE E. BRILLY

Barr H. A. and Thomson W. F.: Report of Successful Excision of the Spleen for Traumatic Rupture Complicated by Traumatic Intestinal Paresis, Malaria, and Hookworm. *Texas St. J. Med.* 1916 xii, 334.

Barr and Thomson report the successful excision of the spleen for traumatic rupture complicated by autumnal malaria, and hookworm disease.

The patient fell striking his left side two and a half days before the time of his operation. The immediate symptoms were severe pain in the left side and vomiting these persisted followed by abdominal distention tenderness weak rapid pulse, and a rise in temperature.

Upon opening the abdomen, there escaped a large quantity of fluid and clotted blood. The spleen was found enlarged and torn throughout two-thirds of its extent.

In a blood examination made about one month after the operation crescentic malarial forms were found present. They disappeared under quinine treatment only to reappear at a later date evidently having developed in the absence of the spleen.

Vigorous thymol treatment failed to free the stools of hookworm eggs.

D. L. DENFORD

MISCELLANEOUS

Most Abdominal Gunshot Injuries (Bauchchuesse im Arlege) *Beitr. Klin. Chir.* 1916 c, No 2

Of 26 abdominal small arm gunshot wounds 11 recovered 44 per cent. Most of the recoveries were in cases of through-and-through shots which probably caused no intestinal lesion. Concomitant intestinal injuries give the wound a very serious prognosis, and any hoped for improvement in such cases can be effected only through operation. In through-and-through shots by small caliber arms where there is no injury to the intestinal canal conservative treatment is advisable. Even when such injuries involve parenchymatous organs especially the liver operation will rarely be indicated. Operation when necessary should be undertaken at least ten to twelve hours after injury. The treatment of wounds due to shrapnel bullets follows a similar course. Generally the prognosis of abdominal injuries due to grenades is hopeless. Out of 37 such cases only 4 recovered. Every grenade abdominal wound must be operated upon if the condition of the patient admits of it. In intraperitoneal injuries the indications for operation may be delayed longer than in the case of small

caliber arm shots, and the time for operation may be later. In explosive mine injuries the course of action is the same as in grenade injuries if there is any chance left for operation.

On the whole two facts are to be noted: first that

the prognosis is much more serious than experience in previous wars led us to suppose, and secondly that conservative treatment must yield to operation when the facts of the case require it, and the conditions warrant it.

W. A. BRIDGES.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Young, J. K. Subacromial Bursitis. *Thorp Co.*
p. 211.

The largest bursa about the shoulder joint is the subacromial situated between the upper portion of the capsule, the acromioclavicular ligament and the acromion, and extending downwards beneath the deltoid muscle. Its size varies but it is usually about 2 inches in diameter. It does not usually communicate with the shoulder joint.

After an injury to this bursa the inflammation results in a serous or plastic effusion and thickening within the bursa and of the external capsule. The supraspinatus tendon is often ruptured. Calcareous deposits are sometimes found. The affection is characterized by localized tenderness and swelling at the tip of the shoulder just below the acromion process with limitation of abduction and external rotation. The scapula is locked by spasm of the shoulder muscles and is referred to the hand and is often referred to the point of insertion of the deltoid. Fluctuation is occasionally present.

Differential diagnosis. Fractures of the tuberosity and of the anatomical neck of the humerus always show ecchymosis swelling with insensibility of the arm, crepitus and localized tenderness. Inflammation of the sheath of the biceps has a localized tenderness and pain in the beginning of abduction instead of pain after rotation of abduction. In circumflex paralysis there is inability to raise the arm or absence of muscular contractility beneath the palpating fingers on effort to raise the arm. Chronic arthritis shows tenderness over the great tuberosity and in the axilla and crepitus on motion. Tuberculosis of the head of the humerus can be absolutely proven only by the X-ray.

The prognosis is good under operative treatment but prolonged fixation delays recovery. The greatest benefit is derived from the operation of opening and draining the bursa, allowing the sac contents to escape into the surrounding tissues, and holding the arm suspended by the wrist to the head of the bed, after which the arm should be carried in a sling for three weeks. The after-treatment should consist in hot-air bathing, massage and manipula-

tion of full and painless abduction and internal and external rotation. Excision of the bursa is not advised.

R. G. PACKARD.

Saunders, M. False Coxalgia, Arthritis and Osteomyelitis of the Hip. *Med. Press & Circ.*, July 1.

In the diagnosis of coxalgia, arthritis and osteomyelitis must be carefully stated. In acute suppurating arthritis the thigh is in flexion, the hip is swollen, there is high fever and an abscess points generally in the gluteal region or in the inner aspect over the adductors. Abscesses from suppurating inguinal and iliac glands may be ruled out by absence of gluteal tenderness. Through-and-through drainage is advised which if properly done assures recovery in four or five weeks.

Osteomyelitis of the hip may start from a lesion of the os acromioclavicular at the site of the junction of the segment with an abscess pointing in the quadrilateral surface of the iliac bone near the ischiofemoral fossa or above the pubes. The most frequent form is that of the femoral neck, always associated with arthritis and which is soon followed by detachment of the femoral head. The constitutional symptoms are well marked. There is severe pain and fixed attitude of flexion and abduction. Complications include detachment of the femoral head and pathological dislocation; the latter can be evaded by traction. If the lesion gets worse in spite of early drainage recovery may take place with pseudarthrosis. The pathological dislocation is often mistaken for congenital dislocation and is much more serious because reduction is usually impossible and if possible cannot be maintained. Proper treatment here, too, consists in adequate through-and-through drainage with traction of the limb and later resection if the detached head of the femur plays the part of a sequestrum.

R. G. PACKARD.

Depage, Contribution to the Study of Articular Wounds. (Contribution à l'étude des plaques articulaires.) *Bulletin de la Soc. de Chir. Par.* p. 6, 1914, 72.

Depage submits a statistical report of knee-joint injuries treated in the Ambulance Service from December 1914 to November 1916. Out of a total of 723 wounded there were 14 with knee-joint lesions. Eleven of these with multiple lesions and

who died within a few hours are not discussed here. Of the remaining 113 cases, 30 were only slight lesions with few or no osseous lesions and recovered rapidly under simple treatment. The severe injuries 83 in number are classed in two categories: (1) wounds without large joint openings and without very serious lesions of the osseous extremities; (2) articulation wounds with severe and extensive lesions of the osseous extremities.

Up to September 1915 Depage, after preliminary treatment by clearance and excision, drained the articulation four or more times, changing the dressings once or more daily. Irrigation with antiseptics, and immobilization were employed.

In 16 wounds of the first category 4 were treated by cleansing, disinfection and immediate closure of the synovial all recovered. Of 12 which were drained, 2 recovered without suppurative and in 10 arthrotomy was necessary. 5 of these recovered with ankylosis and in the other 5 amputation of the thigh was necessary of these 1 died of septicemia.

In 13 severe wounds of the second category wide opening and clearance of fragments was necessary in the beginning, the further treatment has been substantially similar to the preceding cases. 2 recovered without suppurative, 10 suppurative of which 4 recovered after arthrotomy, 6 were amputated with 3 recoveries and 3 deaths. The thirteenth case was resected at the beginning and recovered.

From September 1915 to July 1916 Depage adopted Carrel's method after a wide opening up of the articulation. The results were of 26 wounds of the first category there were 15 recoveries with complete restitution of movement, 2 recoveries with ankylosis without suppurative, 9 suppurative of the joint. Of these 9, 2 recovered after arthrotomy followed by resection, 4 recovered after arthrotomy resection, and amputation, 1 died of gaseous septicemia.

In 6 wounds of the second category the knee was broken into fragments in 2 cases in both there was recovery without suppurative. One other case recovered without suppurative. The other 3 cases were resected at entrance and recovered.

Since July 1916 Depage has systematically adopted immediate closure of the articulation in spite of extensive osseous lesion prior to this time he had sutured the synovial only once. After elementary clearance and excision of all injured tissues the following procedure is followed: lavage with Dakin's solution or ether, curettage of crushed bone parts—a small drain is left in the joint for 24 hours. The limb is immobilized. After 8 to 10 days massage and passive movements are instituted with later on mechanotherapy. Since July 1916 Depage has treated 22 cases, 2 were resected at entry on account of their condition and recovered. Immediate closure of the articulation was performed in the remaining 20, 19 of which have recovered with very extensive movements, 1 required resection after some days and is recovering.

The total results are summarized by Depage in the following table:

| For the Two United Categories | 1st Period | | 2nd Period | | 3rd Period | |
|--|------------|----------|------------|----------|------------|----------|
| | 29 Wounds | Per Cent | 31 Wounds | Per Cent | 21 Wounds | Per Cent |
| Recoveries with restoration of movements | 24 | 10 | 40 | 87 | 80 | 36 |
| Suppurations of the knee | 68 | 80 | 18 | 12 | 4 | 51 |
| Ankylosis with or without resection | 37 | 93 | 18 | 75 | 13 | 63 |
| Amputations of the thigh | 34 | 40 | 15 | 62 | 0 | |
| Deaths | 13 | 88 | 3 | 06 | 0 | |

W. A. BRENNAN

FRACTURES AND DISLOCATIONS

Hyndman, C. E.: Observations from Two Hundred Routine Fracture Cases. *J. Mo. St. M. Ass.* 1916 xii 573.

Hyndman reports his observation on 200 cases of fracture occurring in his service at the St. Louis City Hospital.

He calls attention to the good results obtained by the simple methods of treatment, only 13 cases out of the 200 required operation. Of these 6 were depressed fractures of the skull, 1 femur was plated, 1 articular fracture of the tibia nailed, 2 patellas were wired, 1 bone graft used for non union of the humerus, 1 head of femur resected for non union and for fracture of a dorsal vertebra where pressure on the cord was apparent.

Hyndman's method of handling these cases consisted in careful inspection, palpation and measuring both sides as gentle manipulation as possible and sterilization of compound fracture with tincture of iodine. If there was much contusion of the compound wounds they were enlarged and drained and 1,500 units of tetanus antitoxin administered.

If the deformity was great reduction was attempted at once. If slight, reduction was deferred until after a skilgram had been made when further efforts were undertaken if indicated and permanent fixation dressings applied. For this purpose the author prefers to use plaster-of-Paris casts, stirrups, gutters or molded splints where possible. Cases of Colles' fracture were treated by means of plaster-of-Paris casts or a light posterior wooden splint. Fractures of the femur were put up in Hodgson splints or in casts after the method of Whitman.

D. L. DESPARD

Forrester, C. R. G.: The Prevention of Disability Following Fracture of the Os Calcis. *Illinois M. J.*, 1916 xxx, 385.

Fractures of the os calcis constitute 1.22 per cent of all fractures according to an estimation by Rostock based on 1,393 cases. They are invariably comminuted and usually the result of a fall from an elevation. On account of variations in, and markings on, the bone it is always advisable to have roentgen pictures taken of both heels for comparison. Upward and outward is the usual displacement of the

posterior fragment which results in flat foot from the removal of the posterior buttress of the arch. There is thickening of the osseous posterior to the medial malleolus and especially below the sternal malleolus. Extension and flexion of the ankle is normal but lateral motion pronation and supination are markedly limited.

If displacement is present reduction must be effected with passive immobilization. In case for about six weeks until some reaction is obtained attaching a hook and chain to the tendo Achilles tendon on which traction can be made, but not my being done if necessary. Cotton reduces the inflammation of the outer walls of the bone by pounding with mallet. The author's treatment consists in tenotomy of the Achilles tendon, pulling the heel bones down by pressure of the heel and putting the foot in plaster in hyperextension, and in the case of the pad and the heel. The displacement of the outer walls is reduced when necessary. This method precludes the subsequent risk of external rotation, continual pain under the outer malleolus and inability to walk on uneven surfaces, which disabilities are very frequent result of this fracture.

W. A. C.

SURGERY OF THE BONES, JOINTS, ETC

Pauchet, V. Treatment of Pseudo-arthritis by Bone-Grafting (re des pseudarthroses par la greffe osseuse). *Progr. Méd.* 900 p. 50.

Pauchet has found from experience that the use of Lachaplan plates in the pseudo-arthritis which occurs in the course of military surgery is unsatisfactory. He has therefore abandoned it. He uses the bone-graft method employed by Albee which is simple and efficient. This is based on the same principle as the Albee operation, i.e. to remove regular integral bone graft comprising all the vital parts of the bone. In order that the graft should take the tissue must not be traumatized. The operation must be done rapidly with clean sections. On removal the graft must be at once placed in serum and utilized within the day. Absolute hemostasis must be assured in order that hematoma be obtained. The removed bone must be integral and possess its periosteum and each bone layer must be placed in exact correspondence with the same part in the receptor bone viz. periosteum must unite with periosteum, compact tissue with compact tissue and so on. The graft should be sufficiently long to allow absolute contact and there should be no fibrous tissue between the graft and the receptor bone. Therefore the cicatricial fibrous bands of the pseudo-arthritis must be excised so that normal bone only will be in contact with the graft.

Pauchet opposes the procedures of Walthe and Albee in the preparation and application of the bone-graft. The procedure is contra-indicated in patients who offer any risk of local infection.

W. A. BREYMAN

Orth. O. Fascial Plastic in Traumatic Cl. b-Foot. (Fascienplastik bei traumatischer Spitzumhüllung). *Z. Unfallch.* 900 p. 48.

Owing to the war the number of club-foot cases has markedly increased. In the treatment redress measures massage and gymnastic movements have been used with unusual success and the question of amputation for further military duties arises. These cases can be made useful again only by operation and then only by the lengthening of the tendo Achilles according to the method of von Beyer and Albee. A long Achilles tendon has not undergone too much shrinkage or fibrous degeneration this method accomplishes the desired end. The situation however is entirely different if these factors are present or if the lesion is primarily within the tendon itself. In such cases the transplantation of pieces of fascia has helped. The primary fear that pieces of fascia would become necrotic — that being so surrounding tissue at all — was shown to be unfounded so that the method can be recommended. The method employed is shown in the accompanying cut. Exact indication of detail is essential. After two weeks passive motion is begun. After three to four weeks active use of the foot is resumed. The result is very good. Of three patients operated upon two are able to do field work and one garrison work. L. A. JURETTE.

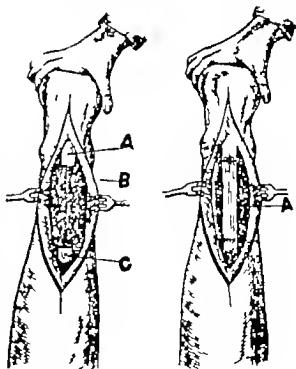


Fig. 1

Fig. 2

Fig. 1 A peripheral end, B excised tendon C proximal end.

Fig. 2 A transplanted fascia.

ORTHOPEDICS IN GENERAL

Wright, H. W.: *Some Aspects of the Treatment of Infantile Paralysis*. *Med. Rec.* 1916 31, 1064.

The author discusses in full the acute subacute and chronic stages. He believes that complete immobilization of the larger muscles and the trunk during the first two weeks from the onset of the attack would aid in diminishing the severity of the process in the anterior horns by reason of the lessening of reflex and voluntary activity applying the principle of complete rest as it is ordinarily applied to any local inflammation. Lumbar puncture if done early should also help by relieving pressure. After the first fortnight the author considers the treatment to be chiefly orthopedic and that for the next month the avoidance of stretching of weakened muscles by proper splints is the most important factor. By that time the extent of the primary paralysis will have been determined and braces should then be applied to enable the patient to be up and about. For this is an aid to the improvement of the muscles not permanently affected.

Attention is called to the fact that an arch support is not sufficient for the type of case in which the tibialis anticus muscle only is paralyzed because it will not control the pull of the unaffected abductors and the calf muscles. Attention is also called to the need of a long brace with a pelvic band in those cases in which the external rotators e.g. sartorius and others are intact and the inner rotators and adductors of the thigh are affected with resultant habitual external rotation and abduction of the leg when walking. This attitude leads eventually to genu valgum pronated foot and scoliosis.

Electricity massage and muscle training have an important part in the treatment of the subacute stage providing they are carefully supervised by the orthopedist and not left to ignorant attendants. Electricity is a convenient instrument for exercising individual muscles which are partially paralyzed and cannot be exercised by the will without strain. When muscles can be controlled by the higher centers muscle training would seem to be the more efficacious because of the element of co-ordination through the cerebrospinal tracts which here enters in.

The operative treatment after all possible spontaneous recuperation has occurred should be governed in many instances by the present or probable occupation of the patient. In the case of the foot stability is the object most desired rather than the restoration of motion by muscle transplant. If the transplant will not be of sufficient strength to prevent ligamentous strain without apparatus. Tenotomy e.g. of the tendo achillis, will often relieve the stretch upon a weak muscle so that it will further recover power under conservative treatment. Tendon lengthening within the tendon sheath is far preferable to simple tenotomy because no cicatrix is produced in the tendon. It is a much better method for overcoming contracture than stretchings

and plaster redressment which involves much time and may produce cicatricial tissue in the tendon. Operative orthopedics without the proper follow up treatment which the conservatively trained orthopedist can give is deplored.

Jacobson A. C.: *The Girls Feet Elementary Principles in Their Care*. *Med. Times* 1916 xlv 334.

Weak foot is more often recognized today than ever before and seems to be increasing. The etiological factors include walking on hard street pavements neglect of muscular development that comes from going barefoot soft diet and over weight walking with the toes turned out and wear log shoes with pointed toes and high heels.

In normal walking with the feet parallel the weight comes first on the heel then on the outside of the foot and lastly on the ball of the foot but when the feet are turned out the body weight falls on the inner side of the foot giving a tremendous strain which soon relaxes the ligamentous and bony arch.

As to treatment if a shoe is worn at all, in girls the high-laced shoe is preferable with the last straight the shaft high and narrow and sloping to the outer side and in weak feet raising the inner border of the sole by a lift or two. Walking with the feet parallel is recommended and certain exercises may be given. Cases with pain or spasm may have to be strapped or in severe instances may have to be corrected under anesthesia and held in plaster casts for a month.

ROBERT G. PACKARD

McKenzie, R. T.: *The Treatment of Convalescent Soldiers by Physical Means*. *Pac. Roy. Soc. Med.* 1916 Surg. Sect. 3.

The command depots of the English army afford relief to the various regimental depots and other places overcrowded with men who are useless from the military standpoint but to whom there is hope of cure or improvement within a period of six months. Two or four thousand patients are assembled in one depot. They consist of cases of neurasthenia shock in all its forms disorders of sensation contractures and paralyses rapid and weak hearts rheumatism in all its forms bronchitis from gas poisoning asthma and even tuberculosis profound debilities following infections and the many wounded in the convalescent stage. For almost all these cases treatment with some form of physical therapy is given—electricity hydrotherapy massage mechanotherapy corrective exercises physical training and marching.

McKenzie reports an analysis of all classified cases sent out of the Heaton Park Depot up to date, which shows that of all men discharged nearly 50 per cent have been rendered fit for active service about 15 per cent have been sent to lines of communication abroad 15 per cent have been sent to useful work of a sedentary character at home and

20 per cent have been discharged as "permanently unfit." The average time spent in treatment was well under three months and although every man is

not completely cured, his opportunities for a useful career in civil life after the war have been enormously increased.
R. B. COVINE.

SURGERY OF THE SPINAL COLUMN AND CORD

Guillain, G. and Barré, I. A. Injuries of the Spinal Cord in War (Les plaies de la moelle épinière par blessures de guerre). *Pres. med.* 9 6 p. 497.

In the present war injuries of the cord are most frequently due to shell fire. Of the authors' cases 61 per cent were due to shrapnel, 3 per cent to bullets, 8 per cent to shrapnel.

In addition to the usual symptomatology paraplegia, disturbance of muscular tonus, neuromuscular contractility, botulism of the es etc. the authors have observed in paraplegic patients with abolition of all tendon reflexes that after percussion of the rotulan tendon even with the quadriceps muscle maintaining absolutely erect there is a more or less vivid contraction of the posterior thigh muscles most frequently of the posterior femoral muscles with a sometimes slight flexion movement of the limb which is the precursor of what has been termed inversion of the tibia flex. This is a true reflex and may be properly termed the posterior tibio femoral reflex.

While sensory painful disturbances are less frequent in the majority of cases, in some cases absolute anesthesia is most frequently absolute and total. Muscular atrophy is sometimes extremely pronounced, urinary and fecal retentions are almost always present.

In the authors' plan, description of the general symptomatology in injuries of the cord is a chapter still to be written as it is not definite and any text on etiology. In the beginning of the first few days the patient feels relatively well and has no appearance of severe injury. The two most marked symptoms at this time are excessive thirst and insomnia. Sooner or later the appetite which was good is lost, loss of weight is rapid, and so anorexia is almost constant.

Of 600 cases in the authors' service the mortality was 80 per cent. Of the other 200 treated cases several are known to have since died. The authors are in reality only cognizant of 4 cases of amputation subsequent to surgical intervention and spontaneously.

In a table given by the authors it is seen that most cases do not survive three weeks. The maximum survival observed was fifty-seven days in a case of lesion of the eighth dorsal segment.

What are the real causes of such rapid death in these injuries of the spinal cord? The authors believe that urinary and pulmonary infections which have been indicated by some as the cause may be

excluded. Patients injured in the sacral or dorsal region usually succumb to a purulent meningitis, but the principal cause appears to be a progressive cerebri. The causes of death according to the authors' view should be classed as purulent meningitis, disturbance of the sympathetic nervous system of the digestive tract, abdominal viscera and vascular glands, cerebri through default of assimilation, anemia of the cerebral centers. If the lesion is very grave the sympathetic nerve is usually the maximum.

There is little difficulty in diagnosis. The only question is of differentiation between complete and incomplete section or a hematomyelia, a medullary disturbance or a compression.

In complete section (anatomic or physiologic) motor paraplegia is complete, urinary retention absolute, all the tactile, painful, thermic and vibratory reflexes are abolished, all the tendon reflexes are abolished. In incomplete section the abolition of sensations, especially (thirst) is not absolute or global, even segmental attitudes may be preserved. Traumatic hematomyelia is almost always complicated by sanguinary effusion in the pia mater and in the space which may be demonstrated by lumbar puncture.

The authors think that all spinal injuries radiography is dispensable not only to show the nature of the osseous lesions but also to determine the relationship to the traumatic situation of the projectile.

Treatment consists in the association of neurology and surgery. Every spinal wound should be explored as quickly as possible, the entry orifice stripped, the wound disinfected and the bone examined. All fragments should be removed. The authors discountenance the use of antiseptics which may be harmful to the exposed medullary tissues. Manipulation in this region should be as delicate as possible. Chloroform, ether as anesthetics are very badly supported and the authors prefer a local anesthetic.

If on prior examination there is no evidence that the dura mater is opened the absolute rule of surgery not to open it must be respected. But if it is open prolonged ligature with warm physiologic serum at slight pressure is the only treatment. Any attempts at suturing according to the authors' experience is absolutely useless.

The question of removal of the projectile is open to discussion. If it is situated at the back or at the sides of the cord or if it is intramedullary it should

be removed. When the projectile has traversed the cord causing perhaps only a partial section and is lodged in a vertebral appendage its removal although possible from the surgical viewpoint is a matter of opinion because in such event new lesions will be created which may turn an incomplete section into a complete one

W. A. BRENNAN

Humphries R. E. and Durham H. A.: End Results of the Treatment of Tuberculosis of the Spine, Hip Knee- and Ankle-Joints from the Records of the New York Orthopedic Dispensary and Hospital *J Am M Ass* 1917 lxviii 282

The authors report the results obtained in the treatment of surgical tuberculosis at the New York Orthopedic Hospital for the fifteen years ending with 1910. In the 184 cases included in the statistics there were 517 tubercular spines, 461 tubercular hips, 156 tubercular knees and 50 tubercular ankles. The average duration of treatment for all these cases was six and one half years. Results with ankle cases were better than those of all other joints, most of them being cured with no deformity. Of the knee cases 25 per cent had ankylosis, 75 per cent had more than 15 degrees motion and 38 per cent had more than 90 degrees motion. There was a mortality of 61 per cent. Of 461 hip cases 246 were located and of these 11 were found cured. The mortality was 24.4 per cent. The spine cases showed a mortality of 22.8 per cent. Of the 125 cured none had any decrease in the kyphosis, most of them 73 per cent showed a perceptible increase of the deformity. Even among those operated upon by the Hibbs method which has been the routine there for the past four years 30 per cent

had some increase in deformity at points other than the area operated upon.

W. A. CLARK

Ely L. W.: Ankylosing Operations on the Spine; a Study of Two Specimens in the Laboratory *J Am M Ass* 1917 lxviii, 183

The author has made a histologic study of two spines on which ankylosing operations had been done, one by the Hibbs, the other by the Albee method. The former case came to autopsy five months after operation as a result of pulmonary embolism. The spinous processes at the seat of operation had disappeared and the union was in interlamina rather than interspinous. The ankylosis was almost complete, only a little motion between the bodies of the vertebrae could be detected. The one diseased body was wedge shaped with the products of the necrosis bulging posteriorly. As the disease was limited to the center of one body it is held by the author that Fraser's idea of the synovial origin of bone tuberculosis is erroneous and that lymphoid marrow is the determining factor in the location of the disease. In the second case in which the Albee operation had been done the specimen was dissected two years later and firm union was found. The disease in the body of the vertebra was in process of healing.

The author reports two deaths on the table in his experience with these operations and attributes them to the anesthetic. In the discussion of this paper it is brought out by Hibbs that the success of his operation depends much on the dissection and that the object is to eliminate motion by eliminating the articulation and not by splinting the vertebrae.

W. A. CLARK

SURGERY OF THE NERVOUS SYSTEM

Halliburton W. D.: Possible Functions of the Cerebrospinal Fluid *Proc Roy Soc Med* 1916 x, Sect. Neurol. 1

The cerebrospinal fluid is a clear liquid of low specific gravity containing inorganic salts, a trace of protein and a certain amount of glucose. Only under abnormal conditions is the protein matter much increased or are cellular substances present. The recognition of which is valuable in diagnosis. It is formed primarily by the secretory cells covering the choroid plexus. The pressure at which it is present is not the result of arterial pressure but of secretory pressure of the choroid epithelial cells. It is found experimentally that carbon dioxide, volatile anesthetics, and choroid gland or brain extract injected into the circulation will cause an increased flow and pressure of the fluid. This is evidently due to a specific action on the choroid plexus and is

exemplified in cases of general paralysis and brain softening.

With regard to the destination of the fluid, it is probable that it passes out of the craniovertebral cavity by means of the blood vessels and not, as formerly supposed, by the lymph channels of the nerves. Certain substances injected into the cerebrospinal canal are very rapidly diffused into the circulation. The diffusion is more rapid in the cerebrospinal region and becomes slower as the lower spinal region is approached. Diffusion in the opposite direction, from blood to cerebrospinal fluid is practically nil. There is some escape of fluid along the cranial nerves, especially the olfactory. This channel connecting with the tissues outside the craniospinal cavity has been considered a possible source of entry for infective agents, for example, infective poliomyelitis. The normal

function has been thought to be similar to that of the lymph. At present the general opinion is against this comparison (since the cerebrospinal fluid is wholly independent of the vascular system) except for the fact that nutritive material may be carried to the nerve tissue by means of the fluid. On the other hand the abundant evidence that the fluid is a true secret and by means of a specific function of the choroid plexus is kept free from substances the blood of which might be harmful to the nerve tissue. The protective function of the choroid plexus is shown experimentally by the fact that very minute doses of poison injected into the subarachnoid space produce fatal whereas (given subcutaneously) the fatal dose may be a thousand times greater. By means of this protective and secretory action the fluid supplied with the proper nutritive balance peculiarly needed by the nerve tissue and harmful substances, has thus been excluded.

FRANK B.

Durox, K., and Coussy, A. Experimental Contribution to the Study of Nerve-Section and Restorations (Contribution expérimentale à l'étude des sections et des restaurations nerveuses). *Presse med.* 963: 57.

The authors experiment with man dogs and from these they draw the following conclusions:

From the morphological point of view dogs do not act differently from man sections of the same important nerves (terminal peripheral axons) nerves of great sciatic nerve re-anastomose only by slight disturbance of locomotion.

The immediate restoration of the functions of a sectioned nerve after there is only a small restoration effected (the long lapse of time are real and the authors experiment with dogs have demonstrated that true scientific proof of restoration is very delicate. In cases where such has been found physiology demonstrates corroborating histologic observation, that the peripheral end recovers its functions only when it has been penetrated by the axons of the central end.

3. In cases of complete sections suture must be done and sometimes graft if there is much loss of substance.

4. A nerve compressed by conjunctival proliferation must be freed. Such conjunctival proliferation improves the play of the compressed nerve and enhances the functioning of other nerves of the limb.

W. A. BERNARD.

Corbett, J. F. The Technique of Nerve Repair in Traumatic Injuries. *J. Lawt.* 96: 735.

Corbett relates the pathology, symptoms and technique in the repair of traumatic injuries.

His conclusions were based on 104 animal experiments in which actual clinical conditions were simulated by proceeding separately where the nerves were sectioned with one dense connective tissue bandage but the site of the operation as being that almost every fully sectioned nerve can be united with the re-establishment of function, but restoration of function of a nerve surrounded by scar tissue is almost usually damaged is very difficult.

A obstructed path must be secured for the denervation of the distal end of the nerve. Intervening between the severed ends of the nerve and that of the path, the nerve itself must be removed by a vertical section until normal nerve section is reached. Hemorrhage of the nerve must be checked and the blood free ends of the nerve should preferably be exposed through-and-through.

If the distal end of the nerve together the space may be treated by sutures by fitting fascial tubes for the nerve distal ends be added to the nerve.

Amongst the chief causes of unsuccessful results re-failure remains no growth of neural connective tissue. Therefore control of the neural hemorrhage too deeply placed tissues where sewing the sheath the use of loss or fascial tubes of pre-existing scar tissue and infection.

D. L. DUNN.

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

Heldingsfeld, M. L. Etiologic Role of Scar Tissue in Skin Cancer. *J. Am. Med. Assn.* 96: 499.

A report is given of two cases of skin cancer developing in scars on the leg with discussion of the general problem connected with the origin of neoplasms developing in scar tissue. These two cases developed sometime after the original injury

which was a burn. In each instance and had been healed. Its earlier form may be mistaken for simple ulceration. Altescopie examination showed the new growth to be of the spindle-celled type. Scars from external burns offer the largest field for development of this type of cancer. The author thinks epithelioma of the basal-cell type is derived from the sweat or sebaceous glands and their ducts, or from hair follicles, and not from the basal layer of the epidermis.

HAROLD SLOAN.

Bland-Sutton. J. Case of Arsenic Cancer. *Brit Med J* 1916 II, 788.

Auxetics is a term applied to chemical and physical agents capable of stimulating epithelial cells to unwanted activity. In pathology the term is more particularly applied to agents that can provoke such changes in epithelium as to predispose them to become cancerous. It has long been known that soot lime pitch tar arsenic and caustic soda are auxetics in the stricter sense. To these have been added during the last twenty years X rays and radio-active substances such as radium. Chronic ulcers caused by burns and scalds are also liable to become cancerous.

The first illustrative case is that of a man aged 60 who was employed to wash telegraph cups in a solution of caustic soda. One day he splashed his arm with the solution and this caused an ulcer which never healed. Two years afterward he came to the hospital with a typical cancerous ulcer enlarged lymph nodes at the bend of the elbow and in the axilla.

As a result of X ray treatment a rodent ulcer may be transformed into a squamous-celled ulcer. An illustrative case is cited.

The case of arsenic cancer developed in a patch of psoriasis on the leg of a woman aged 60 who for thirty years had suffered from psoriasis, and during this period had taken more or less continuously arsenic in the form of liquor arsenicalis. It was necessary to amputate the limb through the middle of the thigh.

In cases of arsenic cancer the order of events is somewhat in this style. Arsenic taken internally for a long time—years—leads to thickening (keratosis) of the skin especially on the palms and soles. These thickenings crack and allow bacteria to enter and infect the skin. In rare instances these chronic linear ulcers become cancerous.

A remarkable case has been reported in which a cancerous ulcer appeared in a patch of psoriasis on the skin of a finger under a wedding ring. The patient had taken arsenic. It is said that this form of cancer does not infect lymph nodes, and the investigation of inguinal lymph nodes in Bland Sutton's patient supports this statement.

P. G. SKILLERN JR.

Depage, A.: The Treatment of Shock (Le traitement de choc). *Bull Ass. Méd. Soc. de Ch. de Par.* 1916 XLII, 2764.

According to Depage vasoparalysis is one of the most important phenomena of shock. The condition is somewhat similar to that caused by an abundant hemorrhage and this is even more pronounced if there is a real hemorrhage as well.

In the condition of shock the nutritive exchanges are reduced to a minimum, nutrition of nerve-cells is particularly defective and organic defense is almost completely disabled. Infections particularly gaseous septicæmia in such conditions take an easy hold on the organism.

The treatment of shock consists in

1. Placing the patient in such a position that the abdominal vessels will be at a more elevated level than the heart and the brain.

2. Warmth. Depage thinks that heat constitutes one of the essential factors of recovery from shock. Every patient attacked by shock is in fact cold and no longer reacts. By warming him the cellular vitality is stimulated. The nutritive exchanges are favored the vital reactions and consequently the organic defense are re-established.

3. Re-establishment of blood pressure to a sufficiently high degree either by increasing the quantity of the sanguinary fluid or by vascular constriction.

The author gives the details of how these desiderata have been effected in his ambulance service.

For the blood pressure a primary injection of one and a half liters of Locke's serum is made slowly in about 10 minutes. The formula of this is

| | |
|--------------------|--------|
| NaCl | 0.9 |
| CaCl | 0.02 |
| NaHCO ₃ | 0.02 |
| Glucose | 0.02 |
| Water | 100 gr |

The maximum quantity of this preparation injected is half a liter in about 10 minutes. If the pressure still continues to drop an intravenous injection of adrenalin and isotonic serum is made. By this treatment the author has never lost a patient through shock.

W. A. BRENNAN

SERA VACCINES, AND FERMENTS

Hess, A. P.: The Separation of Serum into Coagulative and Non-coagulative Fractions. *J. F. & Med.* 1916 XLIV, 70.

The author mentions the known fact that diphtheria antitoxin is associated in horse serum with its pseudoglobulin constituent, and that for therapeutic purposes this protein fraction has been extracted from the whole serum thus obtaining a purer or refined antitoxin preparation. It seemed to him possible that the same principle might be applied to the coagulative factor in serum, and that in this respect the active substance might likewise be linked with one protein fraction rather than with the serum as a whole. As horse serum is extensively used for hæmostatic purposes he thought if the coagulative principle could be separated it might lead to the preparation of a refined hæmostatic as potent as the original serum and containing a greatly diminished amount of protein. With this end in view, the albumin, the pseudoglobulin and the euglobulin were separated by means of ammonium sulphate of various strengths and were tested for their coagulative efficiency. A brief report of this work was made by the author some time ago. Although this process does not yield protein fractions of absolute purity Hess states it is the best method for the purpose affording a sharp demarcation

between the group of albumins and globulins and a fairly sharp division between the soluble pseudoglobulin and the less soluble englobulin.

The method followed was the one used in the Research Laboratory of the Department of Health, New York, for the preparation of refined diphtheria antitoxin. It consists of diluting the serum with one half its volume of water and then precipitating the globulin with a 3 per cent ammonium sulphate solution. A small amount of pseudoglobulin coming down in the course of the process. The ammonium salt is then added up to 54 per cent to carry down the pseudoglobulin and which is then added to the filtrate to precipitate all the albumin.

The fact that the englobulin is precipitated closely associated with the pseudoglobulin from the blood is of clinical value as it is of theoretical interest as it makes possible the preparation of a filtrate containing about 90 per cent of protein which is more potent than the whole serum. It is 60 to 70 per cent of the filtrate. The ultrafiltrate is then prepared by the method here made in the laboratory from horse serum and employed during the past few months in numerous cases of ileocolic. This englobulin is totally sterile and has been passed through a Berkefeld filter and is safeguarded against decomposition by the addition of 0.3 per cent thymol.

Plans to report later will be on the use of the therapeutic use of englobulin. It is to be shown that it has been employed in the various most difficult cases of tractable hemorrhage. While horse serum has been so largely resorted to, it is not that it is a certain case it has seemed to bring about most satisfactory results. In no instance they claim has there been any toxic reaction. While intravenous injection was resorted to, englobulin seemed to be preferable to serum which is not so fully three times the quantity of protein and it also seemed to him to be absorbed more quickly from the subcutaneous tissues. In all probability he asserts it will be to find out the same indication as whole serum possesses, the advantage of concentration and concentrating the introduction into the body of a much smaller amount of foreign protein. (G. J. E. L. B. L.)

Da la, D. J. Vaccine Therapy Its Possibilities and Limitations. *J. Am. Med. Ass.* 96, 1916, 5.

Recent work tends to show that many a balance the so-called foreign proteins and their derivatives may when injected especially at the veins quickly cause a severe chill followed by high fever, leucocytosis and certain changes in the blood, especially the appearance of ferments. These proteins may be derived from disease germs or they may consist of other animals' tissues as serum, proteases and milk. After the rather severe reaction, marked improvement and even permanent cure may result in certain diseases especially typhoid and in rheumatic and gonococcus infections. This may be due to the high fever and to increase in the ferment

and leucocytes of the blood. Other factors are probably at work.

The non-specific effect of vaccines is just now probably the most important problem that concerns the clinician. The possibilities of development along this line are many for the principle concerns an immense number of diseases both in man and the lower animals. Questions concerning ultimate cures, relapses and dangers can not now be justly appreciated because of lack of data.

This form of treatment should be referred to either as specific or as vaccine therapy. It is non-specific and usually but not necessarily protein therapy.

The important domain of vaccines is protective, not curative according to present data.

EDWARD L. CORRELL.

BLOOD

Bisell, W. W. The Amount of Fat in the Blood Stream of Persons with Broken Bones: A Preliminary Report. *J. Am. Med. Ass.* 96, 1916, 92.

Bisell employed the Kurnagawa Suto saponification technique to determine the amount of fat in the blood of persons with broken bones. Preliminary test with humans first showed the percentage of error: this method to be less than 0.1. Thirty-one human persons being discharged as cured from the hospital gave an average of 0.44.

Twenty patients with fractures of one to ten days later were operated by amputation as has dyslipidemia and pulse enlargement of cyanosis, the fat in the blood was 0.44 per cent of fat in the blood. In 54 of these patients subsequently died in the hospital the blood was taken post mortem.

Bisell believes that it is reasonable to conclude that in persons with broken bones there is frequently a remarkable amount of fat in the blood stream and almost incredible amount of fat may be in the blood stream and yet not kill. Further it might be assumed that the amounts of fat free in the blood stream of persons with broken bones vary from time to time and it is very essential for interpretation of these results to remember that in nature the whole blood examined with the patient's cases the fat determination was made on blood removed from a vein in the hollow of the elbow, the fat so recovered being fat which passed through the capillaries of both the pulmonary and systemic blood vessels.

ALBERT EBERSTEIN.

Holm, P. F. Subcutaneous Administration of Fresh Human Blood. *J. Lancet* 96, 1916, 733.

Holm advocates the subcutaneous injection of fresh human blood because its technique is simpler than that of the intravenous method and because of its freedom from toxicity to the recipient.

He has used this method in pernicious anemia with improvement also in hemorrhage of the new born hemorrhage from gastric ulcer and in splenomyelogenous leukemia.

The blood is drawn from the vein of the donor in syringes holding from two to four ounces of blood and immediately injected into the patient's flank or abdominal wall deep into the subcutaneous tissues.

D. L. DREYFUS

BLOOD AND LYMPH VESSELS

Kallima T: Some Cases of Traumatic Aneurysms (Nagra fall af traumatiskt aneurysma) *Finska Lak sällsk handl.*, 1916 livlil 1633.

Kallima describes four cases of traumatic aneurism occurring in industrial workers observed and treated by him in 1910. Three of these were aneurisms of the carotids one of the carotids communis one of the carotids interna and one was an arteriovenous aneurism between the carotids communis and the vena jugularis interna. The fourth case was a radial aneurism. The aneurism of the carotids communis was treated by resection of the artery and use of Carrel's circular suture with good result. In the aneurism of the carotids interna, ligation of the carotids communis interna and externa and vascular resection between the ligatures was done. In both cases the vena jugularis interna was resected. The arteriovenous aneurism was complicated with a following neck phlegmon necessitating incision and tracheotomy. In this case the patient succumbed to septicemia and heart failure. The radial aneurism was treated by ligation of the radial artery and vein and the sac extirpated.

Reviewing the results of ligation treatment and the unfavorable prognosis of carotids communis ligation—33 per cent mortality—Kallima thinks that conservative treatment should be aimed at as much as possible. He mentions a point not sufficiently clear in the literature of the subject viz the proper time for operative intervention in the treatment of aneurisms. Operation should be performed at the earliest stage when it is a case of a fresh vessel lesion with a surrounding hematoma or at the beginning of the favorable later stage. During the intermediary stage as observed in the two cases of carotid aneurisms treated by the author operation is hindered in a great degree by the profuse reactive connective tissue growths about the vessel as well as in the surrounding interstices. The intermediate stage may be reached ten days after lesion but even five weeks after the accident no symptoms of retrogression may appear. Kallima suggests that for the proper elucidation of this important question for practical purposes animal experiments would be desirable.

Kallima describes a new technique in vascular surgery which is applicable in cases where a defect exists in a main vessel trunk in the immediate neighborhood of the outlet of one of the large lateral branches and where anatomical conditions

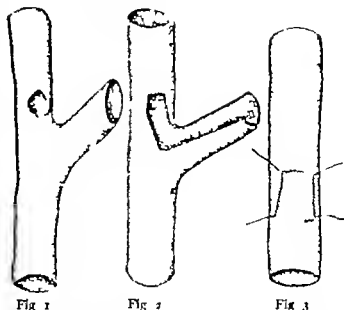


Fig 1

Fig 2

Fig 3

are such that a resection with suture because of technical or other difficulties is not possible. The indication for this method was given by the aneurism of the carotids interna in which case the defect noted in the medial artery wall was situated immediately above the bifurcation. In such a situation resection with the circular suture is technically almost impossible. According to Kallima's method the externa should be ligated leaving a sufficiently long stump. This stump is then split lengthwise on the side corresponding to the defect. This provides a tongue-shaped piece of material with which the defect can easily be covered by a plastic operation after excision of the lateral branch and part of the main trunk wall near its outlet. The technique is shown in Figs 1, 2 and 3. W. A. BARNES

Baudet R: Arteriovenous Jugulocarotidæan Aneurism Due to Gunshot; Ligation of the Three Carotids and Double-Ligation of the Vein (Anévrysme artérioveineux jugulo-carotidien par écart de trois ligatures des trois carotides et double ligature de la veine) *Bull et mém Soc de chl* Par 1916 xlii, 2 51

The interesting case reported by Baudet was that of a direct communication between the carotid and jugular with an intermediate sac. It is the aneurismal varix, the simple phlebarteriectasis of Broca which is opposed to diffuse arteriovenous hematomata characterized by a more or less abundant sanguinary effusion communicating with the injured carotidæan vessels.

A sac formed at the expense of the dilated internal jugular existed and communicated with the artery by a narrow orifice. The jugular was so adherent to the carotid in the vicinity of the sac both above and below it that the liberation of the two vessels was impossible, and it was necessary to ligate the jugular and the external and internal carotids en masse.

allows the latter to collapse spontaneously or to be obliterated by suture thus affording immediate relief of pressure on neighboring structures it diminishes the risk of subsequent infection particularly if a projectile is present in the sac it facilitates restoration of function in the neighboring muscles and joints it diminishes the resistance offered to the collateral circulation and to the venous return thus minimizing the risk of gangrene it enables displaced structures to resume their normal positions

Ligation is indicated in preference to plastic procedures under the following conditions (1) if the artery is small unimportant or difficult of access (2) if there is infection in the scar (3) if the extent of the injury is such that suturing or end-to-end anastomosis is impracticable or very difficult (4) if the adjacent walls of the artery are injured or diseased in which cases thrombosis or hemorrhage will probably follow an attempt at suturing (5) if the patient's condition is such that any prolongation of operation or anesthesia is undesirable

As to the time for operation in the majority of cases the best time to operate is as soon as convenient after the discovery of the aneurism provided the surface wounds are soundly healed (usually two to four weeks) that is as soon as it may be undertaken under ordinary aseptic conditions.

About a week's time should be allowed to elapse after epithelialization is complete before the wounds are considered as soundly healed. Exfoliating shreds of epidermis should have disappeared and the skin should be smooth and firm. This condition may be hastened by picric acid dressings. By this time collateral circulation will have become established, and the patient will have recovered from initial shock fatigue or exhaustion. Earlier operation will be indicated in the presence of signs of infection in the sac hemorrhage or threatened hemorrhage, rapid increase in the size of the aneurism severe persistent pain and occasionally for increasing signs of pressure on neighboring structures.

The marked disadvantages of postponing operation to a later period are increase in the size of the aneurism thickening of the sac increase in the amount and duration of pressure on neighboring structures, particularly nerves increased difficulty in effecting conservative measures such as end-to-end anastomosis.

As to the question of hæmorrhage hæmorrhage from the aneurism during operation may be controlled either by (1) elastic constriction (2) the application of clamps to the vessel, or (3) by direct digital pressure applied to the wound in the artery from within the sac. Pearson prefers the first method and gives indications for all three.

As to the technique Pearson in suturing closely follows Carrel's technique. Carrel advocates the use of vaseline in the preparation of the suture

materials but Pearson has found that liquid paraffin renders the needles and sutures easier to handle and the results appear to be as good. The consensus of opinion now favors silk in preference to catgut but if vascular suture is attempted in the presence of infection catgut should be employed. After end-to-end anastomosis the junction may be wrapped snugly in a strip of deep fascia taken from the thigh. The method of dealing with a nerve in close relationship to the aneurism is described.

As to the treatment of arteriovenous aneurism many cases of aneurismal varix cause little or no inconvenience to the patient and may not require operative treatment. On the other hand varicose aneurisms present the same needs for treatment as do simple aneurisms.

Aneurismal varix may be treated either by (1) dividing the connection between the artery and vein and suturing the opening in each having first applied constriction to the limb or secured both vessels above and below in clamps or (2) by ligation of the artery above and below the anastomotic opening and ligation of any intervening branch.

Varicose aneurism should be dealt with where possible by the intrasaccular route. When the sac has been opened and cleared the wounds in the vessels should be carefully examined and dealt with on their merits. In the case of important vessels ligation of both artery and vein together should be avoided if possible and when the continuity of one appears to depend on the sacrifice of the other the vein should be preserved rather than the artery except in the case of the internal carotid and internal jugular vessels, where the former is the more important. P. G. SKILLMAN JR.

Wynee O. W. J. Richardson, D. T. and Dodson G. E. *Cases of Gunshot Wounds of Blood Vessels from Mesopotamia. Brit. Med. J.* 1916 ii, 789.

During the past eighteen months of the Mesopotamian campaign, twenty-four cases of bullet wounds of large blood vessels have passed through the Colaba War Hospital Bombay including three cases treated by operation prior to admission to which no further reference is made in these notes.

The cases have shown a considerable degree of variety: 4 were obliterative lesions, 8 were arteriovenous aneurisms, 9 were diffuse false aneurisms.

The arteriovenous wounds included one of the subclavian vessels, one common femoral, one superficial femoral and two popliteal, one peroneal and one acromioclavicular.

The authors give 12 case reports including traumatic aneurisms of axillary, brachial, superficial femoral and deep femoral vessels and 3 arteriovenous aneurisms.

The following conclusions are drawn:

1. Cases of diffuse traumatic aneurism require early operation in all cases.
2. Results of operation at the point of the lesion are satisfactory.

3 Fifty per cent of arteriovenous aneurisms benefit temporarily at any rate by delay in operative treatment considering the known results of operation in these cases.

4. Considering the proportion of obliterative lesions care in the early treatment and good transport arrangements probably reduce the incidence of diffuse false aneurisms.

5 Where the direct effect of sepsis is suspected in cases of diffuse false aneurism free drainage after operation is unattended by danger of secondary hemorrhage.

6 Effort should be made to establish in most cases of destructive gunshot arterial lesions within a month of the date of injury.

P. G. BALLANTINE, J.

Kausch, G. A Case of Post-traumatic Stenosis of the Femoral Artery: the Symptomatology of Which Led to Diagnosis of Aneurism. *Berl. kl. W. h. n. r.* 96 N. 4.

In this case reported by Kausch a soldier who was wounded in the thigh had symptoms which were judged to be due to an aneurism. He was discharged regularly. He was seen several months later by the author. Examination of the anterior surface of the left thigh indicated strong gurgling sound. There was a slight pulsation felt and auscultation a very strong systolic murmur was heard especially in the neighborhood of the wound scar. There was also a slight murmur in the popliteal artery. Kausch had no doubt of the diagnosis of aneurism and operated. As incision of the tissues proceeded the murmur became fainter. When the femoral artery was exposed the murmur was very weak and diffuse. The artery was isolated particularly the gurgling sound was heard in the circumscribed area at the site of the old wound canal. Nothing else was found but the artery for some centimeters showed a slight circular fusiform tumour. The gurgling was limited exclusively to the tunicle re-

The author thinks that there is no doubt but that the stenosis caused the murmur and it is notable that such a slight stenosis should cause such strong murmur. It might be expected with more reason that murmurs would be produced at the points of bifurcation of the artery but this is quite clear that the lumen is not constricted there.

Kausch points out that according to our present knowledge a lesion of the arterial wall however slight, causes an aneurism and of stenosis and in any case he does not deride how by a lesion of the wall a circular aneurism could be formed. The method by which gunshots can cause an arterial stenosis is plainly uncertain and a perusal of the literature does not throw a light on the matter. Differential diagnosis between arterial stenosis which causes manifestations similar to aneurismal and an aneurism itself is difficult. The gurgling sound was the most conspicuous phenomenon and according to Kausch is the most important for the differential diagnosis. W. A. BRADSHAW.

POISONS

Gibson, C. L. Comparative Value of the Methods of Treating Tetanus. *Am. J. M. Sc.*, 1906, 411, 78.

The article is based on the study of nine cases and review of the literature particularly of recent writings upon the treatment of tetanus in the war zone. A review of the history the author points out that two periods can be recognized that in which the treatment was chiefly sedative and the second period where the treatment consisted largely of the use of specific. Although many recent statistics based on comparatively small numbers of cases give a greater improvement over those of the Civil War (Iran or Prussia) Wars when the mortality was 60 per cent, yet the most recent series, which bring the subject up to date—435 cases collected by Abbott and Johnson—the mortality was 66 per cent. Johnson believes that the period of incubation is of prognostic importance, the short incubation giving most serious symptoms and high mortality and vice versa. The severity of the wound or injury did not affect the time employed, the factors affecting mortality. Not only wounds inflicted in war did not show a high mortality but a very high mortality in the British Royal Army Medical Corps the collected statistics showed a mortality of 78 per cent. Of 435 fatal cases the average incubation period was eight days, that is, a case which recovered was 10 days.

Then the general measures for the treatment of the wound and of the patient. In the British report the use of carbolic acid and magnesium sulphate which for the most part has been less successful than the antitoxin treatment. The treatment of tetanus advocated by the author may be summarized as follows:

The establishment of efficient drainage of the wound with liberal use of poultices, removal of foreign bodies to the amputation is probably not justified.

Tracheotomy and the use of sedatives. Am. Gibson recommends chloroform and if possible the latter means of controlling spasm with the use of a defective spasm-moother of the pylorus.

3. Antitoxin treatment should be begun as early as possible and before local symptoms appear. Local eruptions or twitching of the extremities may be recognized if tetanus bacilli may be recovered from them and before symptoms develop. At the onset of the examination is positive a titration should be injected first into the region of the wound to the amount of 500 units and intravenously 5,000 to 20,000 units. In the course of the first twenty-four hours 10,000 to 20,000 units should be injected intravenously in two or three doses, on the second day 5,000 to 5,000 intravenously regardless of symptoms, on the third day if symptoms are severe or worse the intraspinal dose should be repeated. If it is thus the patient has held his wound or has improved the daily injection of anti-

toxin intravenously is sufficient until the symptoms abate or cure is established. In the author's series this method was followed in the last four cases with recovery in each case.

Anaphylaxis has been considered as a possible danger in the antitoxin treatment but no instance of true anaphylaxis was discovered in the Royal Army Medical Corps.

HORACE BROWNE

SURGICAL DIAGNOSIS PATHOLOGY AND THERAPEUTICS

Parfitt C. D. Tuberculosis Often of Secondary Importance to Other Pathological Conditions. *Canad. Med. Ass. J.* 1917, vii, 10.

Clinical tuberculosis is generally the result of lowered resistance to the infection which is said to be in the body at all times. Whatever the cause of this lowered resistance the course of the disease is certainly influenced by other physical disorders both those related to it and those quite distant from it. Too often the recognition of tuberculosis associated with other conditions, stops further investigation. Focal infection, for example often plays an important part in a chronic phthisis. In such a case there is even greater stimulation of the tuberculous process which is regarded as the secondary infection.

The author illustrates from his own cases two groups, one where pathological conditions of the respiratory tract accompanied or simulated tuberculosis conditions such as recurrent bronchitis, rhinitis etc., and the other where diseases of the abdomen or pelvis, as chronic appendicitis or pyosalpinx existed in conjunction with pulmonary tuberculosis and fostered its development.

In the cases cited relief from the tuberculous symptoms followed treatment or operation for the accompanying condition in some instances the improvement in the tuberculous condition being most dramatic as soon as the basic cause of the illness was removed. When relieved of a remedial disorder a tuberculous patient will often develop sufficient resistance to obtain a relatively speedy arrest of his disease.

H. G. SLOAN

McRae, F. W.: Conservation of Tissue—Restoration of Function Not Removal of Organs Should be Aim of Surgeon. *J. Am. Med. Ass.* 1916, vi, 158.

The author has done conservative operations on 338 women. Of this number he has been able to get reports from 190. 60 are unmarried, 46 of the remaining 130 have reported pregnancies. Practically all have gone to full term and been delivered of healthy children. One woman has had three children another two another has had three or more induced abortions. Another was delivered of a living child by cesarean section on account of uremic convulsions. Both mother and child are now in good health. Seventeen have had subsequent operations. In this record are included

only the women whose pelvic organs were left in a state compatible with future possible pregnancies. It does not include individuals whose tubes or uteri were removed, or where partial hysterectomies were performed precluding pregnancy.

In his work the author has resected cystic ovaries preserving all healthy stroma suturing accurately with fine catgut. He has endeavored to so separate adhesions embedded ovaries and tubes as to leave the least possible area of raw surface hanging up prolapsed ovaries plicating the ligaments so re-adjusting uterus, tubes and ovaries as to approach as nearly as possible the normal arrangement. A very large majority of these women have been relieved of their suffering and restored to all the privileges and enjoyments of healthy womanhood.

Of 338 ovarian operations, 190 were followed up 60 were unmarried. Of the 130 heard from 64 have been pregnant, some several times. The remaining 158 were lost track of.

| | Total | Preg- |
|--|---------|-------|
| | nancies | |
| Both ovaries resected | 110 | 10 |
| One ovary and tube removed | 75 | 10 |
| One ovary removed, one resected | 30 | 5 |
| One ovary resected | 98 | 12 |
| Ovary and tube removed ovary and tube re- | | |
| sected | 6 | 1 |
| One tube removed, one resected | 2 | 1 |
| Ovary removed, tube resected | 11 | 4 |
| Prolapsed tube, ovary and uterus suspended | 5 | 2 |
| Ovary removed tube resected myomectomy | 2 | 1 |
| | 338 | 46 |

EDWARD L. CORNELL

Fredette, J. W. Bacteremias in the Agonal Period. *J. Lab. & Clin. Med.* 1916, vi, 80.

Fredette discusses the presence of terminal infections and reports his results upon bacteremias in the agonal period of 110 cases where cultures were made from the blood within a few minutes after the death of the patient. Of this number 42 cultures were positive and 71 negative or about one-third of the cases showed a growth.

His conclusions are that the streptococcus was the most frequent terminal invader of the blood stream that the pneumococcus could be isolated in practically all cases of lobar pneumonia dying before the tenth day of the disease that the bacteriological findings at autopsy within a few hours after death though fairly reliable in demonstrating the presence of organisms existing at the time of death do not exclude the possibility of postmortem invasion.

He suggests that the frequent taking of antemortem immediate postmortem and autopsy cultures should be encouraged.

D. L. DESPARD

Hess, A. F.: A Further Report on Thromboplastin Solution as a Hemostatic. *J. Am. Med. Ass.*, 1916, lxvii, 1717.

Hess states that thromboplastin a solution and a fine suspension of ox brain in normal salt solution

with 0.3 per cent of tricresol added as a preservative has proved itself of practical value in controlling hemorrhage wherever it can reach the site of the bleeding. In cases of true hemophilia it may be regarded almost as a specific hemostatic. It is to be recommended for local use in the bleeding of the newborn, nasal hemorrhage and in the parenchymatous bleeding associated with various operations. Where local application fails it should be injected into the site of the hemorrhage as in bleeding from the gums following tooth extraction. This method is readily resorted to as a thromboplast solution loses but little of its potency by dilution and merely diluting it is innocuous when given by mouth in considerable dosage. It would seem to be indicated in bleeding from the stomach and the upper intestine. In addition to its hemostatic effect it has been found to be a very stimulant granulation tissue and hastens epithelialization.

J. L. L. R. R. P.

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Taylor K. Tissue Fragments and Wound Infections. *Int J Surg* 1914 9:613-624

In the course of the experiments by the muscles used in the present work, wounds may be made in the muscle itself, fragments of tissue and detached or severely traumatized tissue fragments. The importance of removing the muscle and the cloth well recognized but sufficient attention is rarely directed to the removal of the tissue which has a bad bed for the incubation and multiplication of bacteria. To determine the relative importance of these factors, the following series of experiments were made on guinea pigs.

As a result of his experiments the following facts seem to have been established:

1. The implantation of a sterile foreign body in a small piece of sterile dead muscle alone produces no macroscopic lesions.

2. The implantation of a foreign body infected with *tetanus bacilli* in a foreign capsule, streptococci produce usually localized abscess formation.

3. The addition of a small piece of dead muscle tissue in the region of the infection causes a more rapid and diffuse inflammatory process than that which occurs in wounds containing only bacteria or in those containing infected cloth.

4. The implantation of infected cloth together with muscle tissue produces a more active and destructive lesion than the implantation of either alone. When infected with the *tetanus bacilli* the presence of dead muscle determines a high mortality.

5. The muscle produces a more acute infective process than the cloth.

The result of these experiments suggests that in the cleaning of fresh wounds as much care should

be exercised in removing the devitalized fragments of soft tissue as is taken to remove other foreign bodies.

GATEWOOD.

DeLzell W. R. Burman G. E. and Pilcher J. D.: The Action of the Various Female Remedies on the Excised Intestine of the Rabbit. *Arch Int Med* 1914 9:611-75.

In recent communication these same authors presented the pharmacologic action of the so-called female remedies on strips of the excised uterus of the guinea pig. Many of them depressed the activity of the strips but it was suggested that this effect might have been nothing more than an action on the striped muscle. General admission that it was in no sense specific to the uterine muscle. To investigate this question an experiment has been made on the smooth muscle, namely strips of the intestine of the rabbit and the arteries of the kidneys of dogs. The results of this work show that these drugs which are classically theuterics.

The experiments on the intestine were made in a similar manner to the experiments on the excised uterus of the guinea pig. A segment of the small intestine of the rabbit about 3 cm. long, was attached to muscle lever and immersed in a well-labeled bath of Tyrod solution and the contractions recorded. Contractions are usually started shortly after placing the strips in the bath and continue for half an hour or more. After obtaining a suitable control, sufficient of the drugs to be examined was added to the bath to make a concentration of 1:1000 as a rule. In all cases a 1:1000 or 1:2000 solution. The same method of extracts of the drugs were used in this work as the previous work on strips of the uterus.

The results of this work indicate that the members of the group of female remedies that act on strips of uterus exhibit practically an identical action on strips of intestine both in manner and degree of action. The other drugs of the group have no effect on either the uterus or intestine. This shows that they in no sense are specifically uterine. While there are no experiments on the effect of these drugs on the intact uterus and intestine it is highly probable that doses that would influence the movement of the uterus would have the same effect on the intestinal movements. Any beneficial action they might exhibit on the uterus — but such action is not conceivable in the present state — would be offset by the effect on the intestines, such as cessation of peristalsis, or in the case of one of the drugs, by a tonic contraction of the intestines.

The drugs in this list known as female remedies exhibit practically the same action on the excised intestine of the rabbit as on the excised uterus of the guinea pig, showing that their action is in no sense specific to the uterus.

The following depress the intestinal strips actively at the concentrations used: Jamaica dogwood, *passiflora unicorn* root and figwort while valerian (the oil is very depressant) and lady's-slipper are

less active and skullcap wild yam liferoot and false unicorn depress very slightly

The following are practically devoid of action
bleasted thistle cramp bark maple bark black haw
passion flower motherwort and squaw vine

They have no effect on the smooth muscle of arteries in rather concentrated solutions

GEORGE E. BEILBY

Lambert, R. A. The Comparative Resistance of Bacteria and Human Tissue Cells to Certain Common Antiseptics *J Exp Med* 1916 xlv 663

Lambert draws attention to the fact that a number of chemicals are strongly bactericidal even in weak dilution when tested on bacteria suspended in broth cultures or in salt solution and that in the presence of serum stronger solutions are usually necessary while in order to kill pathogenic microorganisms growing in the tissues as for example in infected wounds the antiseptic must often be applied in such strength that body cells as well as bacteria are injured or destroyed

An ideal antiseptic he describes as one that will kill the infecting agent without at the same time injuring body cells. Inasmuch as he found it impracticable to carry out on infected wounds—in man at least—experiments directed toward the discovery of such a substance it occurred to the author that in tissue cultures conditions might be made to approximate those in the living organism for bacteria and tissue cells growing together *in vitro* may be easily subjected to the same chemical agents and the effect on each be directly observed. Experiments were therefore undertaken to investigate the comparative resistance of body tissues (wandering cells and connective tissue cells) to various chemicals including especially a number of those in common use as antiseptics.

Human tissues were used throughout the experiments since the author believed that the results would be of more value if clearly applicable to human beings. Tuberculous and Hodgkin's lymph glands removed at operation and spleens taken out at autopsy a few hours after death were the tissues used. With each of these a migration of large mononuclear cells and connective tissue cells was obtained. The organism used was staphylococcus aureus chosen first the author states, because of the frequent infections caused by it and secondly because it has been shown to occupy a median position among the pathogenic bacteria in its resistance to disinfectants.

The table shows that in the case of the majority of the chemicals used (potassium cyanide, phenol, trichloro hydrogen dioxide and alcohol) tissue cells were definitely more easily killed than were bacteria. With certain other disinfectants the difference was not so striking. For example in several experiments with mercuric chloride it was noted that in a few preparations there was a slight growth of connective tissue cells after exposure for

one hour to a dilution of 1:20,000 or 1:40,000 a strength sufficient to kill or markedly inhibit the growth of staphylococci under similar conditions. It was observed however that the cells grew out from the centers of the tissue fragments not appearing until after four to five days of incubation. The author concluded that growth in these cases was due simply to the low penetrating power of mercuric chloride for cultures in 1:80,000 never showed an active outgrowth of peripheral cells.

Alcohol in the strengths used (5, 10, 20 and 50 per cent) was found to be bactericidal in only the highest strength. On the other hand it is noteworthy that human cells showed no ill effects from exposure to 5 to 10 per cent alcohol for one hour. In one series noted there was indeed a better growth of the alcohol treated tissues than of the controls. Further experiments however failed to demonstrate any definite stimulating action on the part of alcohol. The harmful effect of 20 per cent glycerol the author believes is probably referable to the partial desiccation of the tissues produced.

Iodine stands out as the one chemical tested to which cells were found to be more resistant than were staphylococci. A good growth of cells was seen after exposure to a 1:2,000 solution of iodine for one hour a strength sufficient to sterilize the tissue completely in most instances.

The author's experiments afford further experimental evidence of the value of iodine as an antiseptic and indicate that at least in weak aqueous solution it should not as is often stated injure or irritate the tissues. He observed however that iodine had the power of rapidly dissolving fibrin a property which theoretically should not be conducive to wound healing. A similar action by hypochlorites (Dakin's solution) was also noted. Although the wound-cleansing property of the latter which he states evidently depends on this fibrin-dissolving function is favorably emphasized by Dakin it would seem that the plastering together of wound surfaces by fibrin which is thought to facilitate healing would be prevented by the use on wounds of either iodine or the hypochlorites.

In conclusion the author states that the comparative resistance of bacteria and human tissue cells to antiseptics and other chemicals may be easily tested by tissue cultures under conditions which approximate those found in the living body and a comparative study shows that while human cells—connective tissue and wandering cells—are highly resistant to many antiseptics they are in general more easily killed than bacteria (staphylococcus aureus). Of the antiseptics tested by him which include mercuric chloride iodine potassium mercuric iodide phenol trichloro hydrogen peroxide hypochlorites (Dakin's solution) argyrol, and alcohol, the one which seemed to him to approach most closely the ideal disinfectant is iodine which he states kills bacteria in strengths that do not seriously injure connective tissue cells or wandering cells.

GEORGE E. BEILBY

Stewart G N and Rogoff J M The Influence of Certain Factors, Especially Emotional Disturbances, on the Epinephrin Content of the Adrenals. *J Exp Med* 9 6 xxi 709.

In a study, mainly in cats of the epinephrin discharge caused by electrical stimulation of the splanchnic nerves, the authors were led to consider the question whether the amount of epinephrin liberated by a given strength and duration of stimulation is related to the store of epinephrin already present in the adrenals or is independent of that store. Desiring to compare the amount liberated in animals whose content was presumably high with the amount liberated in animals whose content was presumably low, they tried to exhaust the store as far as possible before the experiment of the liberation was made by some of the procedures which according to Elliott cause diminution of the epinephrin load. As a result of their long series of experiments the authors were able to make the following summary and conclusions:

No evidence has been obtained that cats and dogs with disturbances of the adrenal emotional disturbances cause depletion of the epinephrin store of the normally innervated adrenal as compared with the following:

2 The depletion of the epinephrin store in cats under morphine is not dependent upon so-called morphine fright, they claim since similar depletion is found in dogs in which, as is known, morphine produces symptoms the reverse of those of fright. The signs of morphine fright can all be resisted by administering morphine to a cat in which the adrenal has been removed and the entire supply of the other cut they state and in which secondarily no detectable liberation of epinephrin takes place.

3 The reactions of the denervated ones elicited by emotional disturbance, asphyxia, or etherization in a cat one of whose adrenals had been removed and the nerves of the other cut did not differ from those reactions in cat whose adrenals had not been interfered with.

The influence of postoperative edema of the adrenal in diminishing the epinephrin load, and the recuperation of the load after a time were studied in rabbits. The diminution in the epinephrin store of the adrenals which follows operations on animals (postoperative depletion) was also studied. This the authors say is only in part associated with the anesthesia, since it may be as marked six or eight hours after operation lasting less than an hour as after six or eight hours anesthesia without operation.

One adrenal was removed in rabbits and the epinephrin content of the remaining gland assayed at varying periods of time after removal of the first, the periods being longer than the time necessary for recovery from the postoperative depletion. In general they found that the second adrenal contained more epinephrin than the first, sometimes double the amount. Marked depletion of the

epinephrin store of innervated adrenals as compared with the corresponding denervated glands was seen in animals dead of infections of various kinds.

The authors draw attention to the fact as shown by Elliott that diminution of the stock of epinephrin in the adrenal through electrical stimulation of the splanchnics is not easy to demonstrate despite the fact that the liberation of epinephrin into the blood is steadily increased by the stimulation. With short periods of stimulation, however repeated over long time at intervals just long enough to prevent fatigue they found it possible to demonstrate a distinct depletion. GEORGE L. BRLEY

Hadley M N The Influence of Modern Immunity Research on Surgery *J Indiana St M Ass* 9 6 4

If one should outline a method of treating acute surgical infections from the standpoint of the immunologist a rational procedure would be as follows:

First importance and sequence is physiologic, next the part organ infected. This indicates the host whether the adding micro-organisms attack through the appendix. The entire system of lymphatic and venous circulation is dependent upon muscular activity for a normal rate of flow. As it is through the lymphatics that most organisms are spread it follows that anything that will promote lymph flow toward from the point of infection greatly favors the dissemination of the bacteria.

Second in sequence in the treatment of acute surgical infections is drainage. This is an ancient surgical procedure and nothing need be said about it further than when undertaken, it should be accomplished with the least possible traumatization of adjacent tissues in order to obviate the danger of auto-inoculation. Ample clean-cut incisions and the section of rubber tubes or flat rubber tubes rolled to a wick make the best drainage material. Care should never be used for this purpose.

Wet dressings of hypertonic and normal saline solutions make the best dressing for infected wounds.

The use of localized active hyperemia is of great service.

So far as surgical infections are concerned the theoretical indications for vaccine therapy are limited to two conditions: (1) as a prophylactic immunity against suspected wounds (2) in chronic infections.

Summarizing the influence of immunity research upon surgery in a word, the problem of surgical infections has been shifted to the field of biochemistry. It is now recognized that when an individual becomes the host of pathogenic micro-organisms his entire physicochemical balance has been disturbed and under such conditions recovery is to be sought by a resort to those remedies and measures which strengthen and stimulate normal body defenses. EDWARD L. CORRELL

RADIOLOGY

Levin, I.: The Scope and Technique of X Ray Therapy. *Md Rec* 1916 20, 1015

The author discusses in detail those properties of the roentgen ray which render it of therapeutic value and endeavors to place its use in certain conditions upon a rational basis. He maintains that the ultimate effect of radiant energy upon protoplasm is very similar to that exerted by chemical agents in that it causes a disturbance and rearrangement within the atom.

Roentgen rays are considered analogons to ordinary light rays inasmuch as they possess practically all of the physical properties of the latter. Their wave length is much shorter however and it is due to this as well as to the greatly increased velocity that the X ray is capable of penetrating substances impervious to ordinary light. Biologically their action also closely resembles that of ordinary light. In small doses they accelerate cellular function, but in larger amounts they cause inhibition. Different cells react differently. As a rule the less differentiated younger cells or cells in a state of active proliferation are most deeply influenced. As most tumors and granulomata consist of such cells they react readily.

The minute changes observed following roentgenization of cases of cancer and sarcoma were vacuolization of protoplasm, pyknosis of nuclei, cariolysis and complete necrosis of cells. This was accompanied by round-cell infiltration which displaced the destroyed cells and later by the formation of dense sclerotic connective tissue poor in blood vessels. In granulomata the lymphoid cells are destroyed and replaced by fibrous connective tissue. The source of the new connective tissue is not the normal tissue surrounding the tumor but has its beginning either in the stroma of the tumor or in the round cell infiltration following the destruction of the tumor cells.

As to technique employed, the author comments fully on the use of rays of varying penetrability, filters, crossfire application, measurement of dosage and advantages of Coolidge tubes over ordinary tubes. He cites some experimental evidence in proof of the last named. He uses Coolidge tubes exclusively and does practically all of his work with penetrating rays backing up an 8.5-inch spark.

The scope of usefulness of the roentgen ray consistent with its biologic action is twofold—firstly to inhibit cell proliferation and secondly to inhibit cell functions. As examples of the conditions in which the former indication is to be met he cites amongst others carcinoma, sarcoma, granulomata of various kinds, keloids, warts, glandular hyperplasia of the prostate and such skin lesions as lupus vulgaris and mycosis fungoides and reports favorable results in all of them. As types of disease in which favorable action is to be expected by inhibiting the cell function he mentions leukemia, influenced by treating the spleen and bone marrow ex-

ophthalmic goiter, the thyroid and thymus, metrorrhagia and uterine fibroid, the ovary and acromegaly, the hypophysis.

The author does not recommend treatment by roentgen rays in the above conditions to the exclusion of surgical methods nor even in preference to them. In fact he believes every case where surgery is indicated should be thus treated and followed by roentgen therapy subsequently as a prophylactic measure. He believes roentgen therapy should be practiced as a distinct specialty if best results are to be obtained.

ADOLPH HARTUNG

Black, H.: The Detection of Gas in the Tissues by X Rays. *Brit Med J* 1917 1, 9.

The author has found X rays of decided advantage in the diagnosis of the less malignant forms of gas infection, the diagnosis in the acute form being only too obvious. Of the nine cases of gas infection radiographed the condition present was suspected in but few instances and in none was it clinically certain. The gas manifests itself as small areas of lessened density varying in size from 1.5 to 3 cm. In most of the cases several spots were present and were apparently isolated from one another. The areas were more or less oval in shape and had sharp margins. In all the cases, culture showed the presence of the bacillus perfringens. In one case the latent period between the date of injury and the detection of gas was almost five weeks.

G. W. GRINA.

Stewart, W. M.: The Roentgen Examination as an Aid in the Differential Diagnosis Between Pneumonia and Empyema, Especially in Children. *Am J Roentgenol*, 1916 11, 559.

In children the differential diagnosis between these two conditions upon a purely clinical basis alone is frequently impossible. Many cases of effusion may give normal or increased vocal resonance and on the other hand cases of pneumonia are encountered where the physical signs strongly suggest fluid. The author feels that in these two conditions the roentgen findings are so characteristic that the roentgenologist is able in the majority of doubtful cases to clear up the diagnosis at a very early period in the disease, in fact long before positive physical signs appear.

The shadows cast by fluid depend upon the quantity of fluid and upon the presence or absence of pleuritic adhesions. Simple pleural effusion gives a dense shadow extending up from the diaphragm with a cup-shaped, irregular upper surface. In beginning effusion sometimes, especially in children the shadow of the fluid may extend upward on the parietal pleura showing a clear area of lung structure between the fluid and the root down to the diaphragm. If adhesions are present the effusion may become encapsulated in which case the shadow appears as a globular mass encroaching upon the lung structure from the cortex toward the root, the base of the shadow conforming to the shape of the

chest. Stereoscopic plates will aid in accurately localizing these areas.

In lobar pneumonia, the shadows usually begin at the cortex of the lung. They are wedge-shaped, with the base at the pleural surface, and the apex toward the root. They extend until finally the entire lobe is involved. This wedge-shaped shadow is quite characteristic, and can be differentiated from the encapsulated pleural effusion. I GAZZAR.

Hammond, R. A Device for Obtaining Lateral Roentgenograms of the Spine in Hyperextension. *Am J Roentgenol* 916 ill, 580.

The author presents a very useful device for obtaining satisfactory lateral plates of the spine in those cases of Pott's disease which are being treated by the present conservative method where the patient rests on a gas-pipe frame with the spine gradually forced into hyperextension.

In observing the progress of the treatment by means of roentgen examinations, it is customary to remove the child from the frame and place him on his side, in order to obtain the ordinary lateral roentgenogram of the spine. This disturbs the position of the spine considerably. To avoid this, the author uses a curved wooden frame duplicating the curve in the gas-pipe frame. The tube can then be adjusted to take the plate in the lateral direction without disturbing the position of the patient. The wood will not cast any shadows such as would be produced by the gas-pipe. I GAZZAR.

Gaarenstrom C F Sarcoma and Roentgen Rays. *Arch. Radiol. & Electrotherap* 9 6, rd, 10.

A report is given of 23 cases of sarcoma treated. The usual deep therapy technique was used, except that 5 mm. of aluminum, with an equal thickness of leather were used. When deep-seated growths were treated cross-firing through small areas was adopted. In getting at the nasopharynx circular areas of 4-5 cm. diameter were used, with focus-skin distance of 8 cm. Gaarenstrom believes that neither depth below the skin nor the rapidity of growth has the prognostic value that has been accorded to them and is altogether of the opinion that at present the best criterion for determining the sensibility of sarcomata to radiation is the histological structure of the tumors. Round cellular sarcomata are credited as most amenable to roentgenization while spindle-celled growths are less so and sarcomata with polymorphous cells least of all. DAVID R. BOWEN.

Hufnagel, E. F. V., Jr. Technical and Therapeutic Experience in the Ultraviolet Light Treatment of Suppurations and Tuberculous (Technisch und therapeutische Erfahrungen in der Ultraviolet(Bacht)behandlung bei Wundinfektionen und Tuberkulose). *Strahlentherapie* 6, vii, N.

The definite domain of ultraviolet light treatment—to improve the general condition of the

patient—is dwelt on extensively. The combination of raying with the various high-frequency methods of treatment is exceptionally effective. The author does not give the high frequency simultaneously with the rays but after the latter as both procedures applied simultaneously is too severe for the more aggravated cases.

To prevent and overcome the disturbing skin irritation the author employs dioxybenzol which, according to his view in very dilute solution acts in the same manner as the pigment does to change the rays.

In discussing the effect of the rays upon the head, blood vessels, and the poor aeration of the respiratory organs by prolonged exposure to the rays the author reports a chronic light intoxication with central disturbances. He himself contracted it following prolonged exposure in a small raying room.

L. A. JENNIE.

Zimmern, A. Th. Physiological biochemical Fundamentals of Heliotherapy (Ueber die physikalisch biologischen Grundlagen der Heliotherapie). *St. Michaelis* vii, N. I.

It is probable that atmospheric pressure, temperature, ozone contents, ionization, and radioactivity of the atmosphere play an important part in addition to the effect of the sun's rays. It is hardly possible to think of a direct action of the ultraviolet rays upon a tuberculous process, as the effective rays never reach the focus of disease proper. The ultraviolet rays decrease the tone of the superficial vessels. In addition a lowering of the arterial blood pressure results, a better saturation of the skin occurs, increase of metabolism takes place, as well as an increase of the hemoglobin content of the blood.

The pigment production results from the violet part of the spectrum. From the physiological standpoint the pigment can be considered as a black body which changes the chemical energy into heat. This theory of the pigment acting as an energy transformer is further elaborated by the fact that the pigment can become fluorescent. From this point of view the heliotherapy is nothing more than a simple heat therapy by rayed heat. This rayed heat produces at those parts which it reaches a dilatation of the superficial vessels, an increased circulation and an intensive diapedesis.

L. A. JENNIE.

MILITARY SURGERY

Kuettner Foreign Bodies. *Berl. All. Wchnschr* 9 6 No. 24.

According to Kuettner a foreign body must be removed when it causes suppuration also if by its situation it is a source of pain or danger (compression of trunk nerves, a menace to functioning of vital organs). The question as to whether a foreign body which appears included in the cicatrization without reaction or disturbance should remain or

not offers difficulties. There are three points for consideration

1 The migration of the body and the consequent menace to organs of vital importance

2 Latent infection of bodies remaining in the organism

3 Their eventual toxic action

Experience gathered from the war of 1870 has shown that when a projectile is truly included in the recovery of the wound it cannot be held that migrations are verified although the position of the projectile may not always be quite constant

Regarding latent infections after recovery seems complete late suppurations are often observed in cases where the projectile has remained in the organism The brain especially is exposed to such late suppurations Even tetanus may occur late from a wound with a retained projectile.

Regarding the eventual toxic action Lewin has demonstrated that lead when it enters into the composition of a projectile may eventually cause notable damage to the nervous system, the sensory organs glandular apparatus, etc. The chemical constituents in various tissues and cells act as solvents on lead Wieting and Ibrahim tell of a case occurring in the Balkan War of a projectile arrested in the popliteal cavity in which the articular capsule and the surfaces of the cartilage were largely infiltrated with lead salts.

Kuettner advocates extending the indications for extraction not only of projectiles which maintain a determined infection pains and functional disturbances or which are superficially situated beneath the tegument but also deeply located projectiles in which it is judged that any vital danger exists or danger to the wound. Kuettner moreover thinks that when a presumably safe operation is refused both judiciously and for state reasons coercion should be exercised seeing that the greater part of the extraction can be made under local anesthesia.

W A BRENNAN

Ratynski M: War Wounds Treated by Soap
(Traitement des plaies de guerre par le savon)
Presse méd 1916 p 540.

Soap has long been used unconsciously in ordinary life as an antiseptic. The author having obtained good results from its use in cases of hirsuties was led to try its effects in the treatment of wounds, especially infected wounds Ordinary castile soap of good quality suffices and it is used for lavage, irrigations and for local dressings For lavage and irrigations a solution of 25 grams to one litre of sterilized water is used. Compresses are immersed in a 20 per cent solution.

The strengths noted are used because they give a fluid sufficiently limpid so that its appearance is under control during the duration of irrigation and it renders the dressing sufficiently unctuous to be non-adherent As an extra precaution the soap may be exposed to a temperature of 120 for five

minutes to sterilize it or even plunged in boiling water

The technique of treatment of wounds consists in the disinfection of the hands, the careful cleansing of the wound and the application of gauze tampons dipped in the warm soap solution. If the wound is fissured irrigation of all accessible parts is made with the solution Irrigation is kept up till the surfaces are well cleansed and the fluid flows back from the wound without pus clots or filaments. When this is effected a kind of embalming with soap is then proceeded with. For this compresses impregnated with a 20 per cent solution and which are manipulated until a degree of sponginess is obtained are pressed into the interstices of the wound and are left loose to preserve permeability The outer surface is dressed with a porous covering which is covered with wadding and secured The point is that the entire dressing is permeable

The soap solution in contact with the wounded surface provokes the formation of a viscous opaline tinted secretion. This fluid is always produced in the presence of altered albuminoid matter especially pus which is disintegrated and liquefied That this effect is due to the soapy fluid may easily be verified by directing a jet of soapy water on gauze impregnated with pus when the viscous fluid is rapidly produced

With the production of the viscous fluid the wounded tissues become less congested capillary hemorrhage if any is arrested and the surfaces rapidly become vitalized It seems that the non-irritating alkaline and weakly antiseptic soap dressing not only does not injure the tissues but its presence favors the action of defensive and reparatory cells

Pus is aspirated through the porous dressings as it is produced Secretions are absorbed by the double effect of capillarity and alkalinity There is no pain and no trouble in removing the dressing which is generally renewed every second day

Having used this method in 1500 dressings, the author believes the results obtained are at least equal to those obtained with other methods. Extensive burns extensive wounds involving all the tissues amputation surfaces suppurated arthritides etc have been followed to their termination The evolution has been favorable and painless. The simplicity of the technique the facility of obtaining the medicament and its cheapness are further reasons for its adoption W A BRENNAN

Marchak: Treatment of War Wounds with Magnesium Chloride and Secondary Suture (Traitement des plaies de guerre par le chlorure de magnésium avec suture secondaire) *Bull et mém Soc de chir* Par 1916 xlii 2620

For some time Marchak has abandoned antiseptics in the treatment of infected wounds which have given only mediocre results. He now uses magnesium chloride solution exclusively

After preliminary clearance of projectile etc

and resection of necrosed tissue he applies a chloride of magnesium dressing which is changed every twenty-four hours. If there is no resultant rapid fall of temperature, intermittent or continuous irrigation is instituted. This treatment lasts seven to ten days. The pus then becomes viscous, transparent and disappears. When this occurs Marchak makes the secondary amputation. In 18 very severe wounds of which he gives the details, reunion has been obtained completely. 5 early complete in 9.

HARTMANN DELBET and LOTHIERAT expressed their appreciation of the excellent results obtained from the use of magnesium chloride which corroborated the experience of Marchak.

W. A. BRENNAN

Albrecht: The Treatment of Gaseous Gangrene
Berl Kl Wkchr 96 July 7

Albrecht says that in established gaseous gangrene the best remedy is operation as quickly as possible. Incisions should be long and deep, not only in the apparently affected tissues, but also into apparently healthy tissues. Or instead of a single very deep incision, several smaller incisions may be made. This course is necessary in healthy tissue because the gas accumulations are signs of an advanced process and beneath these gas accumulations there is a large zone of tissue without evident alteration as but in which active bacilli are widely diffused.

If necrosis is extensive amputation may be necessary and if the amputation is not made in safe healthy tissue, wide and deep incisions will have to be made in the stump.

Some refractory cases resist even the most radical treatment. Such show the typical yellow pallid tint, anguished faces, pale cyanotic coloration of the lips, a stargazing halo in the eyes, profound general agitation and with terrible pain death comes rapidly. Albrecht holds that death is due to the direct action of the toxin on the heart. Regarding the similarity of the syndrome in these lethal cases with the syndrome of acute complete cessation of the suprarenal function Albrecht has examined the

suprarenals in many of the cases and found them profoundly altered especially was there diminution and disappearance of suprarenal lipoid substance. Hence Albrecht has proposed that in the surgically treated cases subcutaneous injections of one-half to one mg. of adrenalin be made before or immediately after operation, the dose to be repeated on successive days. He believes that he has saved some lives by this method.

W. A. BRENNAN

INDUSTRIAL SURGERY

Eates, W. L. The Workmen a Compensation Law
For M J 916 87

The chief interest in this article lies in the definition of what constitutes a major operation as adopted by the Workmen a Compensation Board. It is defined as follows:

A major operation is a surgical procedure which entails immediate serious consequences to the patient and which requires skill and training to perform and in which:

1. The setting of fractures of long bones and reducing of subluxations, providing accuracy and efficiency of reduction be demonstrated by roentgen ray taken before and after surgical treatment.

All operative procedures, other than finger and toe amputations, cleansing and draining and closing wounds, evacuating pus by incisions, the manipulating and reduction of uncomplicated dislocations, the treatment of uncomplicated fractured ribs, the removal of superficial foreign bodies from the eyes, and the removal of subcutaneous foreign bodies.

Not — All fees for a major surgical operation shall be limited to such charges as are reasonable for similar treatment of injured persons of like standard of living in the same community and where such treatment is paid for by the injured person himself, the charges including hospital service, to be paid by the employer not in any case to exceed the sum of \$75.00.

EDWARD L. CORNWELL

GYNECOLOGY

UTERUS

Muret The Surprises of Exploratory Curettage and the Diagnosis of Uterine Cancer (*Les surprises du curettage explorateur et le diagnostic du cancer de l'utérus*) *Ann. de gynéc. et obst.* 1916 lxii, 321

Muret reports a number of illustrative cases to show (1) that where the histologic examination of the products of a curettage was positive as regards carcinoma yet the extirpated uterus may not show signs of malignancy or only very slight traces after long and patient research (2) that with positive curettage findings not followed by a radical operation the patient often remains free (3) that with negative curettage findings the extirpated uterus may show the existence of carcinoma which has escaped the curette.

From his study of the question Muret concludes that curettage of the uterine cavity carried out as completely as possible with the histologic examination by a competent pathologist is, and remains the surest and best means of diagnosing cancer of the uterine cavity especially in its incipency. In very exceptional cases the curette may remove in totality a carcinoma of slight extent and depth or even a carcinomatous polyp the base or pedicle of which is free. Such exceptional facts admit the possibility of an apparent or even complete cure following a positive curettage but not followed by a radical operation. In case of a radical operation the uterus may then show itself free of any trace of carcinoma.

There exist intermediate cases in which the uterus while apparently free contains some nuclei of malignant neoplasm more or less difficult to detect. Such exceptional cases, however favorable they may appear, do not relieve the patient from the ulterior possibility of metastases into other organs. These conditions are not necessarily the result of diagnostic errors, but their existence is scientifically demonstrated.

The conclusion is that exploratory curettage when it gives a positive result always gives the indication for a radical operation, even though it be followed by other curettings with negative results.

In some exceptional cases a commencing and circumscribed epithelioma may be so situated that it escapes a very complete curettage. It follows from this that in face of a negative or doubtful result of an exploratory curettage when there are suspicious clinical symptoms, they of themselves may be sufficient indication for operation.

Every curettage should be followed by a histologic examination made by a competent specialist

W. A. BRENNAN

Ward F N: Report of a Series of Operations for Uterine Fibroids. *J Am Inst Homoeop* 1917 lx, 779.

The author analyzes her series of 101 operations undertaken for the relief of symptoms due to uterine fibroids.

There were no deaths due to operation. There was one death in a sulphonal habitue subject to cardiac seizures in one such seizure the patient died.

The author urges surgical treatment for uterine fibroids since otherwise one cannot know the complications with a fibroid mass. She urges, too, the formulation of reliable statistics, from which neglected and complicated cases are eliminated.

The ages of the patients in the series ranged from 22 to 76 years with 25 per cent between 30 and 40 years, 53 per cent between 40 and 50 years and 13 per cent between 50 and 60 years.

Of the series 68 were married, of which 22 had borne no children, 33 were single. Of the entire series 46 had borne children and 55 had not. Of the child bearing women the fecundity varied from a single abortion with subsequent sterility to eight children; the large majority had borne from one to three children.

One out of seven pelvic operations was undertaken for uterine fibroids.

The statistics as regards single women are as follows:

Age: Three were less than 30, four were over 50, 26 were between 30 and 50 years of age.

Nationality: 27 were American and 6 were of foreign birth.

Size of tumor: In the single women the tumors were comparatively large, 20 of the 33 rose out of the pelvis.

Clinical symptoms: 6 had retroversions, 16 had profuse blood losses, the lowest haemoglobin being 30 per cent in 18, pain predominated. Pain due to pressure predominated in submucous fibroids with retroversion, haemorrhage predominated in the intramural and submucous types.

There were no complications in 14 cases, in 19 there were ovarian cysts, adhesions, or inflamed adnexa.

An unusual case was that of a spinster aged 60 who had begun to flow irregularly 7 years after the menopause. The flow accompanied by pelvic and abdominal pain and loss of weight gradually increased for one year, during this time she expelled with labor like pains and haemorrhage several submucous fibroids. Hysterectomy was performed and the uterus showed multiple fibroids with one area of carcinomatous degeneration.

A second spinster showed multiple fibroids rising

to the umbilicus and filling the pelvis so that the cervix could not be examined hemorrhage had reduced her hemoglobin to 20 per cent. The corpus uteri was removed through the abdomen and a submucous fibroid through the cervix. With recovery the hemoglobin rose to 85 per cent.

The statistics as regards married women are

Of the 68 married women, 6 had adnexal complications. The tumors were usually smaller than among the single women. However the largest tumor of the series was in a married woman. It rose to the ensiform.

Position of tumors. Two subserous tumors had broken away from the uterus, one lay in the omentum and the other in the folds of the broad ligament. A third patient showing extreme distress had a retroverted uterus with fibroids incarcerated within the pelvis which completely filled.

One Porro operation: full term delivered a living child with excellent recovery. The mother. The extirpated tumor and uterus weighed 3.5 pounds.

Pathological findings. One case showed a papillomatous cyst of the ovary weighing on removal 3.5 pounds multiple, bipertitoneal and interstitial fibroids and an adenocarcinoma in one corn. Complete removal of uterus, tubes and ovaries did not prevent an inoperable recurrence less than six months.

Two cases showed pure myoma and a pure fibroma coexisting in the uterine wall. Both the patients were young and suffered from persistent hemorrhage.

Of four other cases marked chiefly by persistent bleeding, one was a cystic endometritis with senile hyaline changes in the uterine muscle; this patient was 50 years old. Three other cases all young and all bedridden from hemorrhage showed the different stages in malignant degeneration of fibromata. In the first the glands showed irregular growth, secondary hyperplasia but no infiltrating tendency. In the second the uterine glands presented extensive hyperplasia bordering on malignant degeneration; they extended to the muscular coat and seemed to be folded on themselves but did not break through the limiting membrane. The third case showed adenocarcinoma.

Surgical technique. Operations were performed as follows: myomectomies, 9 abdominovaginal hysterectomies, 3 vaginal hysterectomies, 5 supra vaginal hysterectomies with total ablation, 37 supravaginal hysterectomies with removal of one tube and ovary, 3 supravaginal hysterectomies with adnexa left *situ*, 6.

The myomectomies were performed for subperitoneal fibroids so small as not to modify the uterine function. Vaginal hysterectomies were done where the tumors could be shelled out through the vagina. Total ablations were done as a rule early in the series later to avoid premature menopause symptoms some ovarian tissue was left if possible.

The supravaginal method was the favorite. The stumps of the round and broad ligaments were

attached to the cervix and no complications resulted from leaving the latter in place.

The result of surgical treatment of fibroids has been relief of pressure symptoms or blood losses and satisfactory return to health.

The author holds that in surgical technique and result there is little more to be desired. However she urges research not only in general tumor etiology but as to the reasons for the formation of a particular type of tumor, as from fibrous tissue, glandular or muscle tissue. She quotes Gebel as showing the formation of sarcomatous tissue from the muscle cells of fibromata.

Prompted by the signs of infection in married women she urges bacteriological and chemical studies, tumor etiology, fibroids are susceptible to infection especially during labor and the puerperium. She suggests study of the cardiac results of uterine fibromata. Various authors hold that the myocardial changes are due to toxins produced. Unless extreme the symptoms disappear with the removal of the tumor. Rabinovitz shows that the causes of preclimacteric hemorrhage in uteri slightly enlarged but showing no other sufficient pathology is the excessive development of the fibrous connective tissue as compared with the muscle tissue, so that the latter cannot contract and close the arteries. Bacterial and pathological studies of uterine growths during pregnancy and labor are suggested for research.

With a better understanding of fibromata their prevention may be accomplished. The conclusions are as follow:

The frequency of uterine fibromata is marked, one out of every seven pelvic operations being undertaken for their relief.

1. Sterile women are more predisposed to uterine fibromata than women who have borne children—53 per cent of women in this series being sterile.

2. The largest tumors are most frequently found in the nulliparous women.

3. In the women who have borne children, however over 9 per cent had complicating pathological conditions in the pelvis.

4. The treatment of uterine fibroids is essentially surgical, as proved by the low mortality rate and the restoration to health following operation.

Jesse D. Cook.

Goets, P. Myoma and X-Ray Treatment (Myoma und Röntgenbehandlung) *Ins. f. Gynäkologie* Berlin, 9, 6.

Of 67 reviewed terminated cases of uterine myoma occurring in the private clinic of Professor Strassmann and treated with X-rays 55 or 87 per cent recovered and failure resulted in 17 or 9 per cent. In 41 women of the first group 74.5 per cent, amenorrhoea occurred and in 14, 85.4 per cent oligomenorrhoea was the result. All patients were over 30 years of age. The lowest number of treatments necessary in cases completely cured was six in five cases and between 56 and 240 light units were

administered. In two cases over 30 treatments were necessary, a total of 1221 and 299 light units, respectively. In the majority of cases less than 25 treatments were necessary. In 55 cases the hemorrhage decreased at the beginning of the treatment whereas in 6 the hemorrhage increased. In 41 cases the tumor became smaller only in 2 was increased growth observed, and in 24 the size of the tumor remained the same. Only one patient complained of severe climacteric phenomena. The percentage of pure recurrence is 8.9 per cent. Twelve cases were operated upon, two of which were operated upon at their own request, one on account of cardiac disturbances, one for severe hemorrhage and calcification of the tumor, three on account of submucous tumors, and four on account of combined adnexal disease. L. A. JUNKER.

ADNEAL AND PERIUTERINE CONDITIONS

Cattermole G. H.; Dermoid Cyst of the Ovary in a Child of Five Years. *Colo Med.*, 1917 xiv 25

The child was seized with pain in the right side and groin following running downstairs to breakfast. The physical findings were rigidity of the right rectus and a temperature of 99°. After several enemata, relief was afforded and the temperature became normal. The child slept well and at 9 a.m. a round firm tumor in the midline could be made out. The temperature was 99.6° pulse 100. An enema was followed by expulsion of gas and fecal matter and vomiting of bile. At 3 p.m. the temperature was 100.6° pulse 120 urine 1012 and no albumin. The diagnosis was a tumor mass in the lower abdomen causing partial intestinal obstruction. Operation was advised and was performed at 5 p.m. of the second day. There was considerable dark fluid in the peritoneal cavity. The tumor was easily delivered; it was dark red in color, the size of a small orange, and attached by a pedicle to the right ovary. This pedicle was twisted around twice. The tumor mass contained bone, hair and several cysts, the latter containing bloody serum. The child made an uneventful recovery. W. F. HEWITT.

EXTERNAL GENITALIA

Piccardo I. J. Genital Prolapse (Prolapsus genitalis). *Sema a med.* 1916 xliii 499

Piccardo has treated a number of cases of genital prolapse by myorrhaphy of the levators and with a complementary vaginoperineal plastic operation.

Piccardo considers that the basis of the surgical treatment of uterovaginal prolapse lies in the clinical conception that this process should be considered as a variety of hernia through the genital hiatus or pubovaginal loop of the levator ani. If this conception be accepted the surgical methods adopted should be those employed for hernia: in general, resection of the sac and narrowing of the hernial ring. By forcing the argument the prolapsed vaginal walls may be deemed to constitute the sac con-

taining the herniated uterus, bladder and part of the rectum. Sacular resection is substituted by anterior and posterior colporrhaphy and narrowing of the hernial ring is realized by penneorrhaphy with suture of the levators or myorrhaphy. According to some views anterior colporrhaphy is superfluous if ample resection of the posterior vaginal wall is done at the same time as posterior myorrhaphy. It being assumed that this resection suffices to suppress the great laxity of the anterior wall and consequently cystocele. The author however denies that this procedure secures suppression of cystocele as well as resection and suture of the anterior wall in different planes. By its strength is given to the vesical supports the caliber of the fundus is modified and the local inflammatory processes consequential to the prolapse are relieved.

In the cases operated upon by Piccardo anterior vaginal resection was first done. To modify cystocele he made anterior myorrhaphy of the levators that is to say suturing them between the bladder and the anterior vaginal wall.

If this is practiced alone without perineal reconstruction it is an insufficient operation since the posterior vaginal wall by this means will not acquire the support necessary for its normal function, and to this extent the initial cause of descent will still persist. It is better therefore to complete the anterior by posterior myorrhaphy. The author complements the myorrhaphy by resection of the posterior vaginal wall in the form of a triangle, the base of which corresponds to the upper lip of the cutaneous incision, the area being dependent on the greater or less exuberance of the vaginal wall.

Piccardo believes that colpoperineorrhaphy as ordinarily done does not properly reconstitute the muscular floor especially in cases of prolapse due to large lacerations involving all the preanal insertion of the pubovaginal muscle, a floor which is apparently efficacious is obtained but this shows itself insufficient in a short time. Myorrhaphy of the levators as practiced by the author obviates this inconvenience. The idea of myorrhaphy to obtain a good perineal restoration is not new. It was indicated by Soubaroff in 1896 and was practiced by Noble in the United States in 1897.

W. A. BRENNAN

Hartmann H.; Vaginal Hernia and Its Treatment (La hernia vaginale et son traitement). *Ann de gynec et obstet.* 1916 lxiii, 351

Hartmann says that vaginal hernia is generally confounded with genital prolapse, or with certain hernia of the labia majora which have been described under the name of pendular hernia.

Vaginal hernia properly so called is developed in the vagina above the hymen. Its orifice is vaginal above the urogenital diaphragm. It may show under two different aspects, the entire posterior wall of the vagina may form the tumor or the tumor is attached to a pedicle situated more or less high on the posterior vaginal wall.

In a case described by Hartmann the tumor was developed at the level of the posterior vaginal wall but did not occupy all its height its lower juxta-vulvar part being free from any projection. Thus this case is intermediate between the two varieties above referred to. This woman was operated upon several times for supposed prolapse without relief as the vaginal prolapsed tumor always recurred. On operation Hartmann found a serous sac appended in front of the rectum and identical in dimension with the tumefaction which had shown in the vagina before operation. The posterior wall of the sac was a continuation of the anterior face of the rectum and was fused with it. The Douglas cul de sac was closed by peritoneal catgut sutures at the level of the uterine neck, the serous sac resected in its entirety and the operation completed by vaginoperineal plastic reparation.

In this as in other reported cases the patient had been operated upon for prolapse by plastic intervention combined with anterior abdominal hysterectomy. Muret in explaining such an event expresses the opinion that anterior fixation of the uterus by localizing the abdominal pressure on the recto-uterine excavation must necessarily favor other things being equal the formation of a local hernia into Douglas' pouch. Hartmann concurs in this view.

Regarding treatment, mere plastic procedure is insufficient to prevent recurrence as in other hernia the sac must be extirpated and the vaginal wall reconstituted.

W. A. BAKERMAN

Kellogg F. S. Adenomyoma of the Rectovaginal Septum. *Boston M & S J* 97 12

Kellogg quotes Cullen's classification and summary of adenomyoma of the rectovaginal septum, and reports a case of his own. So far he has been able to find in the literature reports of only 15 cases. Etiologically these tumors result from rests of uterine mucosa or from remains of Mueller ducts. It is of the utmost importance to bear the possibility of such a condition in mind and not to mistake it for inoperable malignant disease, which it resembles clinically.

L. R. COLLEMAN

Vineberg H. N. Results and Technique of Vaginal Subtotal Hysterectomy for Prolapsed and Cysto-Rectocele, Associated with Fibroid Growths or Fibroids Uteri. *V F St J Med* 917 xvi 5

Vineberg's method of doing a vaginal subtotal hysterectomy for prolapsed and cysto-rectocele consists in amputation of the body of the uterus at or about the level of the internal os, and making use of the cervical stump as a *pelotte* to hold up the bladder by anchoring it to the subpubic fascial ligament.

The steps in the technique of this operation are identical with those in doing an interposition operation, with the following exceptions:

1. When the ovaries are to be preserved, a ligature is passed around the ovarian ligaments and the uterine end of the tube on either side and the

tissues cut between the ligature and uterus. If the ovaries are to be removed, the ligature is passed around the infundibulopelvic ligament which includes the ovarian circulation.

2. A ligature is next placed around each uterine artery at the level of the internal os. The body of the uterus is then amputated at the desired level by a wedge-shaped incision, the thin edges of the wedge pointing toward the cervix. The edges of the wound in the cervix are then brought together by a continuous or interrupted catgut suture and the raw area of the cervix laterally is sutured in the same way. This latter procedure anchors the cervical stump to the subpubic fascia and outer vaginal wall.

The advantages claimed for this operation are:

1. It supplies a solid support to the bladder and, therefore, the recurrence of cystocele is less likely.

2. It is a less dangerous operation than vaginal total hysterectomy.

3. There is less hemorrhage by following the above technique.

When the vaginal portion of the cervix is hyperplastic, deeply ulcerated or elongated a partial amputation of it is done, leaving enough cervical stump to hold up the bladder.

The author has done this operation 32 times. Three cases are too recent for consideration as to results. Twenty nine cases cover a period of from six months to four years. One case was a complete failure, the cervix and anterior wall appearing outside the vulva. In three cases the cervical stump came down to the introitus but there was no recurrence of cystocele and rectocele. In the remaining twenty six cases the results were excellent.

HARVEY B. MATTHEWS

MISCELLANEOUS

Nble, C. P. The Constitutional Factor in Gynecology and Obstetrics. *Jrg Gynec & Obs* 9 vii 95

The theory of environmental, constitutional hypoplasia or arrested development from unfavorable environment operating at any period from the preconceptual state of dual life in the ovary and testis to that of the youthful period in ontogeny, which was presented to the profession as a medical hypothesis in 1908 is now shown to be equally supported by the clinical and pathological facts of antenatal pathology and by the facts of comparative pathology and to be demonstrated by facts of experimental teratology.

The wisdom of the Fathers of Medicine, as expressed in their discriminating analysis of the facts of the hereditary nature of the diatheses or dyscrasias together with the theory of environmental hypoplasia, constitute the law of devolution in its relation to medicine.

In order to obtain a comprehensive understanding of the practice of medicine, it is necessary to reject such of the teachings of Virchow and his followers

as are fallacious and to combine the clinical wisdom of the Fathers of Medicine from Hippocrates down, with the known facts of experimental medicine and their correct interpretation and thus to arrive at the true point of view from which to study and to deal with the clinical problems which are the concern of practitioners of medicine and of each of its specialties.

The constitutional factor in gynecology and obstetrics as is equally true of the other departments of medicine is the chief element in the clinical problems which confront the practitioner in dealing with disease and with atypical organs and tissues and their functions because it is the factor which determines the nature of the reaction of the organism to a pathogenic environment or disease or it constitutes the sole factor in the atypical morphology and function in the patient.

The recognition, comprehension, and employment of the principles outlined by the author will greatly enlarge the powers of the practitioner of medicine in diagnosis, prognosis and therapy in which it will enable him to avoid many common if not habitual errors and, positively to substitute general nutritional and developmental measures for the local measures currently employed, and thus to effect the cure, instead of the amelioration of his patient's condition, when due to environmental arrest. Further it will enable him to give scientifically based advice as to methods of living when the biologic type of the patient is recognized to promote the development of environmentally arrested patients and to enable them to maintain their health by living within their particular potential or capacity to produce energy instead of attempting to live as is physiological for typical individuals but which will cause disease in the arrested—or hereditary and environmental devolutions.

There remain unsolved, two problems:

1. The process of mechanism whereby atypical morphology and function of environmental origin in ascendants becomes at last hereditary in descendants. Apparently its solution will be found in the facts of the maleficent consequences of inbreeding in human stocks which escape extermination by degeneration and disease and the variations or adjustments which ensue whereby acquired immunity is attained and similar facts concerning the consequences of the long continuance over generations of other unfavorable environment, such as insufficient nourishment, malaria, the hookworm, and food deprived of some element necessary to nutrition or so mistreated as to be relatively poisonous. It may become demonstrated by subjecting short-lived animals to definite, unfavorable environment for twenty or more generations, and observing the facts thus obtained. Facts from biology as to species of animals and plants subjected for generations to inimicable environment, will also aid in the solution.

2. The eradication of degeneracy and its pre-

vention will probably find its solution in the development of eugenics and in the segregation or the sterilization of individuals manifesting the more marked degrees of degeneracy—more especially of the hereditary types. EDWARD L. CORNELL.

Oliver J.: *Generin*. N Y M J 1917 cv 103

Vague notions have existed and found place in textbooks regarding the meaning and purpose of menstruation, but they will be forever banished as soon as it is realized that generin the oxidizing agent which is responsible for the induction of the oxidative processes connected with menstruation, is the same oxidizing agent which is essential for starting gestation.

The energetic oxidizing powers of generin which are probably not unlike those of nitric oxide with sulphurous acid are expended however, only on the production of menstruation in the absence of a fertilized ovum, as the latter is a much more powerful acceptor of oxygen than any group of adult cells can be. Menstruation thus becomes suspended whenever the energies of generin are used wholly in starting gestation and this happens invariably during the two or three days prior to an expected menstruation.

Up to the present time clinicians in reckoning the duration of gestation and embryologists in tabulating and depicting the various changes attributable to definite stages in the development of the human embryo and fetus, have been content to base their calculations upon the date of the cessation of the last menstrual period, just as though fertilization always took place immediately after menstruation and gestation followed immediately upon fertilization assumptions which are in direct opposition to clinical facts and which can never have been considered sound. EDWARD L. CORNELL.

Royston G D: *Experience with the Soluble Extract of Corpus Luteum*. Report of Cases. Interstate M J 1916 xliii, 1119.

In the 47 cases reported nausea and vomiting of pregnancy were greatly improved although one case might have shown the same improvement under the treatment received without the addition of corpus luteum.

Sexual anesthesia is a decided indication for the administration of corpus luteum. The result is more easily attained in patients who have previously enjoyed intercourse. While this effect has not been constantly present notwithstanding regular and persistent dosage, the irregular presence of this feature is highly encouraging. One patient volunteered the information (after the eighth injection) that she had enjoyed coitus for the first time after three years of married life. Another patient volunteered the information that she was sexually normal for the first time, although her anemia showed only a slight improvement. When last seen she was still "feeling fine sexual relations perfect."

The effect in these cases justifies the assumption that sexual anesthesia so extremely common, will often respond to the long-continued and persistent administration of corpus luteum.

Sterility, in the presence of apparently normal female genitalia and living motile spermatozoa, is an indication, especially when the patient has periods of amenorrhea.

Amenorrhea and oligomenorrhea are distinct indications although underlying constitutional disturbances, as obesity, tuberculosis, anemia, etc., should receive appropriate treatment.

Dysmenorrhea, having a hypersensitive nervous system as a basic factor in most cases, is improved through the effect of corpus luteum in reducing this hypersensitive state. Theoretically membranous dysmenorrhea should be an indication par excellence, because of its action in better sensitizing the endometrium.

Menorrhagia and metrorrhagia due to disturbances of the internal secretory system are relieved when the proper arrangement is brought about.

Metrorrhagia alone may be benefited thus suggesting a double function in the regulation of the menstrual flow. The most striking results were obtained in the treatment of menopause symptoms best shown in cases of artificial (postoperative) menopause. All nervous symptoms show marked improvement usually beginning after the third injection. No improvement or relief indicates insufficient dosage.

Patients with very marked symptoms can receive 1 to 2 ccm. doses intravenously very often day without untoward effects with quicker reaction to the substance. The effect upon patients thoroughly treated disappears after two to six weeks (usually four to five weeks) without treatment although they can be continued on 1 ccm. doses at longer intervals, as every seven to ten days in some cases 1 ccm. every two weeks.

Patients, who find it difficult to come twice per week for treatment, can receive 2 ccm. doses once per week in which event the intravenous injection is recommended.

The administration of corpus luteum may be intravenous, intramuscular or subcutaneous the rapidity of effect seemingly being in the order named.

The effects of the substances are of varying duration. Menstrual disturbances are apparently permanently relieved, whereas artificial menopause patients seemingly require it indefinitely.

EDWARD L. CORRELL.

Stein, A. Tetany as a Sequel of Gynecological Operations and as a Complication of Pregnancy. *Istern M J.* 9 6 22 978

This case is reported of a woman, aged 35 years a native of Austria, who was admitted to the hospital for severe dysmenorrhea at six months standing. She had been married and fertile for eleven years. Three years previous she had been

operated on for appendicitis and right adnexal disease. According to her statement she suddenly became "dumb and blind" without any prodromal symptoms during her convalescence after this operation. This disturbance subsided in the course of a week or ten days and she was in good health until she came under observation. No special stigmata of nervousness or hysteria were demonstrable. The gynecological examination showed a small, hard cervix with a tightly contracted os. The corpus was anteflexed and of normal size. The left adnexa was normal and the right could not be felt. The parametria was normal. The diagnosis was stenosis of the cervical os.

The treatment consisted of curettage followed by the performance of a Pözel operation upon the cervix. Four days after operation a slight rise of temperature to 104 F. was noted with a dry non-productive cough, subsiding within a few days. Although the temperature did not return to normal. After operation without warning of any kind, the patient's body stiffened her head was thrown back and held in a rigid position and the hands and feet assumed the characteristic attitude of tetany. Slight strabismus was also present and reappeared on the next day. The temperature at this time was 100.5 F.

For the next two weeks without intermission the patient presented a clinical picture of the following description: Consciousness was entirely preserved and severe pain was complained of. The neck was held rigid and the head was thrust forcibly backward the hands were clenched in typical accoucheur's position the feet were extended with flexed toes. The Chvostek and Trousseau signs were demonstrable and the knee jerks were exaggerated. Clous and Binok's sign were absent. There was a greatly exaggerated response to both the galvanic and radium current. During sleep the general spasticity was apparently relaxed but at the slightest touch the patient's skin the spasms became at once as evident as before.

In the treatment sedatives and narcotics, as well as parathyroid therapy proved efficient. On the assumption of the condition being referable to parathyroid insufficiency the patient received parathyroid extract in one-fourth to one-half gram doses three times daily during two weeks, but the tetany was not relieved thereby. Calcium in 5 gram doses was administered together with the parathyroid extract. The ordinary sedatives, such as chloral veronal, bromides and an occasional dose of morphine were used to control the severe pain and insomnia.

The duration of the disease in this case extended over the usual period of a few weeks apparently uninfluenced by treatment. Hypnosis was tried and was readily induced the patient being of a highly susceptible type but it failed to relieve the spasticity. At the end of two weeks the clenched hands could be partially opened but not without excruciating pain. Dating from this period, the

spasticity gradually subsided and six weeks after the onset of the tetany the patient's control of her extremities was restored. Nine weeks after her admission she left the hospital cured.

EDWARD L. CORNELL.

Gellhorn G: Hematocolpos, Hematometra, and Hematosalpinx in a Woman of Seventy four
Surg Gynec & Obst 1917 xiv 37

In a woman of 74 who had menstruated normally until 35 years previously severe pain, pointing to obstruction of the urinary flow led to the detection of a large fluctuating tumor which filled the entire pelvis and extended upward almost to the umbilicus. The vagina was occluded by senile atresia. Laparotomy in spinal anesthesia showed the tumor to be an enormous hematometra and hematocolpos with bilateral hematosalpinx. Pankysterectomy was performed successfully and the tumor which was connected with the vagina only by loose connective tissue was removed unopened out of its bed. Convalescence was undisturbed the patient left bed on the twelfth day after operation but succumbed to an embolism on the fifteenth day. The cause of bleeding into the occluded genital tract was an adenocarcinoma of the body of the uterus.

Accumulation and retention of blood in the genitals of women past the menopause is very rare and the few reports existing in the literature are reviewed in the author's article. Only one case has been recorded which is similar to the one presented. Considering however the extreme old age of the patient the extent of retention of blood the anatomic condition of the lower pole of the tumor and the modus operandi the present observation occupies a unique position in literature.

EDWARD L. CORNELL.

Dannreuther W T: The Importance of Accurate Diagnosis of the Urological Disturbances Encountered in Gynecological Practice. *Med Rec* 97 xcl 19

The author as a gynecologist justifies his consideration of urology by the signs and symptoms wherein the two fields overlap. He quotes as illustrations congestion of the internal generative organs following pressure on the internal iliac veins by kidney ptosis, vesical irritability from a malplaccd uterus and bladder and urethral symptoms from a migrating renal calculus.

Three courses are open to the gynecologist with a patient showing urinary symptoms to make a blanket diagnosis of cystitis for all urinary ills and use routine and inexact therapy to send the patient to an urologist to himself perform the detailed urological examinations, such as cystoscopy renal function tests etc. Urinary symptoms are often neglected and the author would refer cases to the urologist who understands the variations in symptomatology between men and women. Also

he would have the gynecologist master every urologic diagnostic means, granting urology to be a distinct specialty and at the same time an adjunct to gynecology.

To demonstrate the value of cystoscopy to the gynecologist he cites three clinical histories: first a case in which intestinal and appendiceal symptoms all but concealed a bladder involvement and in which the cystoscope disclosed a bladder papilloma; second a case with an overshadowing picture of pyelitis and neurasthenia and the single urinary symptom of dysuria. In which a probe passed through a nonresistant anomalous urethra was seen at its vesical end by the cystoscope and which showed a caruncle in this anomaly; and third a case treated for two years for bladder trouble in which the cystoscope showed a bladder stone.

The practical diagnosis of early renal and vesical tuberculosis is best based on combined cystoscopic and renal function tests. Careful search does not always disclose the tubercle bacillus and guinea pig inoculation takes time.

In eight cases with vesical irritability following "interposition" operations the author has found chronic trigonitis and in one case a vesical stone developing in three months. In all he has found the prolapse cured but the trigone elevated and distorted with the above sequelae: a deplorable aftermath of the interposition technique now more and more used.

As important points in urological methods of precision the author cites the value of a fresh catheterized specimen rather than a stale dirty one; the macroscopic appearance of the urine; the importance of knowing the daily urea output or nitrogen elimination; and the identification of different epithelia in the urine.

A catheterized specimen drawn in a long sterile tube shows clearly any existing flakes, sediment, turbidity etc. the discovery of which is more important than scanty albumin or casts.

With less than 300 grains daily urea output the gynecologist should no more perform major operations on women than does the general surgeon on men. Also, quantitative urea determinations warn of approaching toxemias of pregnancy possible eclampsia etc.

The exact identification of epithelia in the urine is now proved practicable by Heitzmann and his school.

Intravenous rather than intramuscular, injection of indigo-carmin or phenolalphonephthalein is recommended because by the former method these dyes are more quickly absorbed and eliminated, and the latter method may be painful.

Ureteral catheterization may be unnecessary in cases wherein radiography confirms the clinical findings. Radiography now precedes ureteral catheterization as a diagnostic step. Thus the possibility of trauma to the ureters and renal infection from the bladder is avoided where possible.

JESSE D. COOK.

Borke, J. W. The Influence of Luetic Infection in Gynecology and Obstetrics. *N. Y. St. J. Med.*, 1916 xvi, 569.

Discovery in 1905 of the spirocheta pallida by Schaudinn and Hoffman gave a new impetus to diagnosis accuracy. This was increased by the perfection of the Wassermann reaction in 1907.

The frequency of lues (sex and race) as demonstrated by the Wassermann and other tests is discussed under the following heads:

Lues in gynecology. Luetic cervical lesions most commonly resemble cancer and many such cases have been cured as cancer and vice versa. Cancer is most apt to be situated at or within the external os while a luetic gumma may be separated from it by mucosa apparently normal. The microscope should show the spirocheta and the Wassermann reaction positive for lues.

After the disappearance of severe local luetic lesions in women the traces left are extremely slight. Palmer examined two syphilitic women. Visible signs were insignificant whether or not the patients had been treated. Even deep ulcerative cervical lesions as a rule leave no scars.

The site of the primary lesion is probably some point of genital mucosa or the skin about the vulva. Syphilitic infection of the vagina in the primary or secondary stages is almost unknown. Neumann found 113 on the portio in 757 women with cancer. While cervical chancre is the most common form of female genital primary lesion it is frequently unrecognized.

Regarding the treatment of lues by arsenic reference is made to the elaboration of arsenic by the thyroid and its elimination in the menstrual flow. As to the relation between the relative frequency of lues in the uterus and ovaries and the constant presence of arsenic there is one solution which may be of great value.

Research in the past into luetic invasion of the female generative organs has been fruitless which is remarkable since it is by that route that the spirocheta enters the genital organs.

Lues in obstetrics. Colle's and Profeta's laws are now discredited by the results of the Wassermann reaction. If either mother or offspring is syphilitic, both are.

It is probable that an ovum may be infected by luetic sperm. The most commonly found infected parts of the fetus are the placenta, umbilical cord, liver and spleen. Mohr found the spirocheta in 70 per cent of cases in the placenta where both parents were syphilitic.

Lues in pregnancy. The symptoms vary with the degree of infection. Cervical infiltration may cause dystocia and premature separation of placenta which carries a mortality of about 30 per cent

in mothers and 80 per cent for the fetus. Renal complications of pregnancy are usually aggravated by syphilis. Puerperal infection is more liable to occur if there are luetic lesions about the birth canal.

Luetic infection of fetus. Miller states that 22 per cent of all pregnancies end in abortion but that in luetic women 70 per cent of conceptions thus terminate.

Comiskey studied 1,822 and 1,074 newborn infants. Of these 80 per cent went to term (75 per cent untreated, 81 per cent treated) 7 per cent of the untreated and 10 per cent of the treated had premature labor. Nineteen per cent of the treated and 13 per cent of the untreated had stillbirths. Comparison of women with positive and those with negative Wassermann reaction showed practically no difference but Fournier and Champetier found high infant mortality and abortion in syphilitic women.

Sufficient attention has not been given to the study or treatment of this gynecological and obstetrical condition. Our duty to our gynecological patients cannot be fully subserved without our giving close attention to the discovery and treatment of lues as a complication or the sole condition of gynecological patients indicating treatment.

Routine Wassermann reaction should be made in all adult gynecologic and obstetric patients. Once the diagnosis of lues is made the proper treatment should be as vigorous as is compatible with safety.

In view of the great prevalence of lues it would seem wise to regard all patients as at least mildly luetic and apply antiluetic treatment.

W. A. BEDFORD.

Wade H. A. Operations on the Uterus and the Vagina Without Anesthetic. *Med. Rec.*, 9 6, 20 19.

While they differ in different individuals there are certain areas in the genital tract in women, poorly supplied with sensory nerves. Taking advantage of this fact certain reparative and for rective operations may often be done on the uterus and vagina without an anesthetic. The areas of relative anesthesia are the fundal and cervical mucous lining the mucosa covering the cervical portion of the uterus, and the lining of the anterior and posterior wall of the vagina. Older patients are relatively less sensitive than younger ones.

The following conditions may frequently be relieved by operation without the aid of a general or local anesthetic: endometritis, lacerations of the cervix requiring repair or amputation of the cervix, procidentia due either to hypertrophy of the cervix or to an increase in the caliber of the vagina, acute flexions of the body of the uterus upon its cervix, cystocele, rectocele.

C. D. HOLMES.

OBSTETRICS

PRENANCY AND ITS COMPLICATIONS

Loosee J R. and Van Slyke, D D Toxemia of Pregnancy *Am. J. M. Sc.* 1917 cliv 94.

Two explanations concerning the nature of the substances causing the toxemias of pregnancy have claimed special consideration. They are as follows (1) the suggestion of Ewing and Wolf that amino-acids are incompletely catabolized in the degenerated liver and (2) the idea that abnormal acids in the blood are responsible for the toxemia.

Concerning the first theory Loosee and Van Slyke, by determining the amino-nitrogen in the urine of 23 toxemic women and in the blood of 10 eclamptics showed that there was never an amino-acid content above normal limits. In testing the second or acidosis theory they used Van Slyke's method for determining the alkaline reserve of the blood plasma. In 14 cases of normal pregnancy usually a slight degree of acidosis was found to be present but the degree of acidosis was found to be no greater in toxemic patients of either the vomiting or eclamptic types. Moreover examination of blood from the umbilical cord gave no support to the presumption that the fetus elaborates amounts of acid sufficient to cause acidosis in the mother.

The urea in eclamptic urine was often found strikingly below the average normal. The ammonia was often higher than the average normal, but this abnormality was less striking than that of the urea. The ammonia and urea ratios were strikingly suggestive of those which Nencki and Pavlov obtained from dogs whose livers had been removed.

All the cases of pernicious vomiting showed strikingly high ammonia percentages, but it is noteworthy that no higher degree of acidosis was found than is present in normal pregnancy. It appears quite possible that these high ammonia percentages may be due merely to the enforced fasting which results from excessive vomiting. Regardless, however of its etiological significance the ammonia ratio has an undoubted diagnostic value.

In conclusion the authors state that the toxemias of pregnancy cannot be attributed to either an incomplete catabolization of amino-acids in the liver or to an acidosis and that the nature of the toxin or toxins remains unknown. F C. JAYCO

Hofmeier: Artificial Premature Labor and the Cesarean Operation *Muenchen med. Wochenschr.* 1916 Aug 11

Hofmeier made a comparative study of the results of the two operations based on observations made by him during the last eight years in the Women's Clinic at Wuerzburg. There were 76

cases of artificial premature labor and 73 cases of cesarean section. Of the 149 interventions the mother died in only one case and in this case the woman who had already been subjected to considerable manipulation, arrived at the clinic with a high fever temperature and with the membranes already ruptured. In all cases the cesarean operation was suprasymphic and transperitoneal. About the same number of foetal deaths followed both operations. On an average the duration of convalescence in the operated did not exceed fifteen days. When the cesarean operation is done before rupture of the membranes the results are in no way inferior to those of provoked premature labor hence the author favors it especially in cases of relatively strictured pelvis. W A BREWSTER

Pfaff O G Postmortem Cesarean Section. *Am. J. Obst. N. Y.* 1916 lxiv 967

The author reports two cases of postmortem cesarean section which have occurred recently at St. Vincent's Hospital, Indianapolis. Both babies were saved.

After reviewing the literature on this subject the author states that he is in sympathy with the suggestion that in certain cases of pregnant women at or near term, who are known to be hopelessly ill from rapidly progressing disease, cesarean section is justifiable to save the life of the child. Of course if she be conscious the patient's consent must be obtained. If this were the accepted rule no doubt many lives could be saved which are lost under the present plan of waiting for the mother to breathe her last and for the final heart beat to give us the tardy signal for action. C. H. DAVIS.

Schneller A: Galvanic Muscle-Nerve Stimulation During Pregnancy (Ueber galvanische Nerven-Muskelerregbarkeit in der Schwangerschaft) *Inaug. Dissertation* Erlangen, 1914.

The author found in all cases of pregnancy a gradually increasing irritability of muscles and nerves to galvanic stimulation, increasing with the length of pregnancy and reaching its maximum during labor. In some cases the maximum irritability was found after labor. After birth the irritability gradually declines and the decline is much more rapid than the increase.

The author attributes this to the chemical influence of organs of internal secretion.

The author also tested the influence of ovoglandol, luteoglandol, placental thyroglandol, and thymoglandol upon the irritability of muscles and nerves to the galvanic current during pregnancy and found that with the exception of placental all

Increased the irritability considerably but it again reached the normal about 20 minutes after the injection, or even remained above the normal. Placental caused a transient lowering of the irritability. The cause for this increase is that the foreign protein of the preparations increases the irritability or that after the injections its distribution is different from that elaborated in the organism by the glands. With placental, however, which is obtained from human placenta, the author believes the irritability is due to a cumulative action of the secretions from the maternal organism.

L. S. JURY.

LABOR AND ITS COMPLICATIONS

Leavitt F. E. Prophylactic Episiotomy. *J. Lancet* 97 xlvii, 3.

As to the merits of the operation the author has no plea further than to say that it has seemed a rational procedure in many instances where something more serious would have occurred had he not resorted to it. Like every good thing, episiotomy is capable of being overdone. To make the incision in every case of labor would of course be to inflict needless injury for other measures especially the element of time, overcome in most instances the perineal resistance without doing serious injury.

The author repairs the wound as follows. The first stitch should embrace the wound at its base, bringing into place the severed fibers of the constrictor vaginae and the transversus perinei muscles. The needle is entered at a point on the vulva just above where the scissors began to cut when the section was made. It then is passed obliquely downward in the direction of the other edge of the vulva, coming out at a point on its surface corresponding with the one where it entered. Thus are brought together those tissues which were the first to give way under the blades of the scissors. The stitch may or may not at once be tied.

As soon as this first cabled suture is well placed, a single but loose knot is tied in it a clamp fixed at its ends, and the clamp handed to an assistant. While he makes gentle traction toward the patient's opposite thigh three or four interrupted catgut stitches are put in. The direction of traction is then reversed and the vaginal surface similarly united.

EDWARD L. CORRELL.

Murray J. Surgical Emphysema During Parturition. *Brit. Med. J.* 97 i, 4.

The author briefly reports the case of a primipara, aged 4 who had been attended by a midwife and had been in labor fourteen hours. She presented a most alarming appearance: the face was scarlet and swollen to twice its normal size, so much so that both eyes were completely closed. The upper part of the chest wall and the neck were also much swollen and the affected parts presented all the characteristics of subcutaneous emphysema. The extension of the emphysema was interfering with respiration, and the midwife and relatives thought

she was dying. The child was abnormally large and a large caput succedaneum had formed. Twenty-four hours after delivery by forceps, the emphysema had abated somewhat. In this case the condition would probably not have arisen had the midwife taken less responsibility upon herself and summoned medical assistance sooner.

EDWARD L. CORRELL.

MISCELLANEOUS

Routh A. The Importance of Getting a Pregnant Woman Under Medical Supervision and Affording Her the Necessary Treatment. *Proc. R. Soc. Med.* 96 Sect. Obst. & Gynec., 44.

Every maternity center and antenatal clinic should be associated with hospitals where so-called prematernity beds or wards are available. Observation by experts and medical or surgical treatment can then be carried out.

If midwives could be encouraged to take their patients to a maternity or antenatal clinic the patients would, by such a visit, voluntarily and automatically notify the doctor in charge of their pregnancy without any publicity whatever. This is very different from compulsory notification of the pregnancy to the local health authorities, which would not be carried out at present owing to the ignorance of the value of obstetric hygiene among women and because of the certain resistance of the women most concerned. Any attempt to enforce compulsory notification to the health officer or his representative would, in many cases result in the woman putting off notification till very late, or perhaps not till her confinement and would arrest the good progress now being made in securing medical supervision.

Research work with regard to antenatal pathology must be associated with medical supervision of pregnant women, especially as regards syphilis and toxic albuminuria and the effect of these complications upon the mother and the fetus. For these and many other reasons a pathological and chemical laboratory should be provided within easy access of all groups of maternity centers and clinics in large towns. This could either be a general or lying-in hospital or be one of the laboratories recommended in the report of the Venereal Commission, England. Every fetus and especially every macerated fetus, whether born before or after viability and every ovum however early expelled from a woman who has had other abortions or stillbirths, should be sent to a pathological expert for postmortem examination and search should be made for the spirocheta, pallida or other cause of death.

EDWARD L. CORRELL.

Grossman, J. A Plea for the Prevention and Treatment of Weak Feet Occurring During Pregnancy and the Puerperium. *Med. Rec.* 96 c, 74.

Grossman urges the routine examination of the feet of pregnant women. He says that very little, if any stress has been laid upon the proper shoes to be

worn during pregnancy and the puerperium. Many cases of weak feet are overlooked because of the presence of pregnancy.

He says further that wherever pains in the lower extremities and back are complained of the presence of weak feet should be eliminated. He gives his experience in a series of 700 cases of weak feet 400 of which referred the pain to the lower extremities and back. He mentions the accidents, such as sprains and fractures of the ankle miscarriages which may occur during pregnancy usually associated with weak feet or improper footwear.

Occasionally some of the cases experience very little or no discomfort during pregnancy the symptoms usually occurring during the puerperium. He cites the history of this type of cases.

He describes as chief among the symptoms pain varying from a cramp to a dull ache referable to the feet, calves thighs, or back, weakness tired sensation coldness and numbness of the feet. Objectively eversion of the heels and heel cords is the most constant sign, being present in the vast majority of cases.

In the treatment he places great stress upon prophylactic measures, among which exercises and proper footwear are included. He recommends a shoe which presents the following features:

1. An expansion top to compensate for oedema of the legs.

2. An eighth of an inch elevation on the inner border of the sole and heel to overcome and prevent valgus.

3. A crossbar of an eighth of an inch in the anterior metatarsal arch to relieve and prevent a metatarsalgia.

4. A rubber cushion in the heel between the top lifts and the under lifts to prevent jar when walking.

5. A special antislip finish to the bottom of the sole and heel, to prevent slipping and subsequent injuries.

6. Rounded heel edges to prevent catching in carpet or dress in ascending or descending the stairs.

7. Heels of the height most comfortable to the patient.

8. Shoes built on an anatomic principle so that the body weight bearing is evenly distributed on the feet.

9. Finally shoes built so that they can be worn all day without requiring a change to low cut shoes or slippers.

Among the curative measures he includes exercises strapping Whitman braces and proper footwear.

In conclusion he gives the following suggestions:

1. All cases of pregnancy should be instructed as to the proper care of the feet.

2. Prophylactic measures should be instituted regardless of the presence or absence of weak feet.

3. Where neuralgic pains in the lower limbs, back and sciatic region, and oedema about the ankles are complained of the presence of weak feet should be eliminated.

4. Only by the institution of prophylactic and early curative treatment can we hope to prevent untold suffering in one of the most trying periods which women must encounter.

Curtis, A. H.: Streptococcus Infection as a Cause of Spontaneous Abortion. *J Am M Ass* 1916 lxvii, 1739.

Curtis reports two cases of spontaneous still birth in which a streptococcus was recovered from the placenta and heart blood of both fetuses. In one case the organism was hemolytic in the other non hemolytic.

One patient had had pyelitis during a previous pregnancy and again showed symptoms referable to the kidney. Cultures from her stillborn infant when injected intravenously into two pregnant rabbits caused death and absorption of their fetuses. Streptococci were recovered from the kidneys and uterine cavities of both animals.

The second patient had undergone a septic puerperium some years previous. Cultures from her stillborn child produced premature labor in one pregnant rabbit. Four of the litter were stillborn and the remaining five died in a few hours. A month later after a second injection of the culture this same animal when pregnant again, showed at autopsy absorption of the fetuses and the presence of streptococci in the uterine cavity. A second pregnant rabbit similarly injected showed a like condition. F C Iavino

Simons, J. M., and Morris W. H.: The Non-protein Nitrogen and Urea in the Maternal and Fetal Blood at the Time of Birth. *Bull Johns Hopkins Hosp* 1916 xxvii, 343.

In this series of cases the fetal blood was obtained from the placental end of the severed umbilical cord the maternal blood was aspirated from a vein in the arm. The method employed for estimating the nitrogen was that devised by Folin and Denis. The urea was estimated by the urease method of Marshall with the apparatus devised by Van Slyke and Cullen.

The findings are summarized as follows:

1. In 35 normal obstetrical patients at the time of birth the average rest nitrogen in the maternal blood was 25.2 mg per 100 ccm — extremes 18.5 33.5 mg. In the fetal blood the average was 24.0 mg — extremes 19.34 2 mg.

2. In 16 normal patients the average quantity of urea nitrogen in the maternal blood was 10.5 mg per 100 ccm — extremes 8.4 14 mg. In the fetal the average was 10.4 mg — extremes 7.9-13.5 mg.

3. The urea nitrogen represented 44 per cent of the rest nitrogen in the maternal and 45 per cent in the fetal blood.

4. The same concentration of urea in both circulations indicates that this substance passes through the placenta by diffusion.

5. Before this is said of the rest nitrogen each of its constituents should be studied separately though

It appears that equalization of the rest-nitrogen is normally maintained on the two sides of the placental partition.

6 Complications accompanied by an increase of urea in the maternal blood toxemias of pregnancy syphilis, decompensated heart lesions, and others — are also attended with a corresponding increase in the foetal blood-urea. Pathological cases thus confirm the conclusion that urea diffuses through the placenta.

7 The administration of chloroform during pregnancy causes alterations first in the foetal and later in the maternal blood. Primarily the foetal blood urea is increased. Prolonged anaesthesia causes a moderate increase in the rest nitrogen of both circulations.

8 Asphyxia dependent upon impairment of the foetal heart action is attended with a notable increase in the urea of the foetal blood. In cases of stillbirth this generally represents 60 to 85 per cent of rest nitrogen.

D. H. BOYD

La Fetra, L. E. The Hospital Care of Premature Infants. *J. H. P. D. 1, 9, 7, 11*

In the past two years there have been admitted to the infants ward of Bellevue Hospital New York, 278 premature infants. Of these 13 are still in the warm ward specially provided for premature infants and 265 have been discharged.

These infants are brought to the hospital in the most diverse and curious wrappings, some beautifully swathed in cotton and warm flannels with hot water bottles around them, and many others stiff and blue from exposure and insufficient covering. This means that the mortality is very high and most of it occurs during the first few days after admission to the hospital.

The records of the last 100 patients discharged showed that there were 30 discharged cured. Of the 170 that died among these 200 cases, 90 died on the first day, many within an hour or so of the time of admission. 28 died on the second and 53 on the third day, making 118 that died in the first three days. This means that there were 50 that lived out of the 81 strong enough to survive the first three days of life, that is 30 per cent were saved of those that survived beyond three days. Of those that died the baby with the highest admission weight was an infant weighing 4 pounds 4 ounces. This baby died of general septicemia. One baby reached 4 pounds 10 ounces and died of gastro-enteritis. Another advanced from 2 1/2 pounds up to 4 pounds and then died of acute bronchitis. The lowest weight of those that died was 1 pound, 1 ounce that of an infant of five and a half months uterogestation. There were many that weighed from 1 pound, 12 ounces to 2 1/2 pounds.

The great majority of the babies admitted to the premature ward have a history of uterogestation between seven and seven and a half months.

The causes and symptoms of premature infants are discussed.

Under general management the author states that the inhaled air should be moist and comparatively warm and as free as possible from germs, and the food should be such as to require the least possible amount of digestive effort on the part of the baby. To secure as far as possible the conditions mentioned the hospital has set aside a large room which is kept at a temperature of 76 to 80 F. with a humidity between 60 and 70 per cent. Without this degree of moisture the room temperature had to be much higher and even then the babies' mouths got very dry and their appetites and digestion did not seem so good. Very feeble infants are not only wrapped in cotton, but hot water bottles are put at the bottom and sides of the crib until the baby gains enough strength to keep a normal temperature without them. Few need the bottles for more than a week.

The baby should be handled only when absolutely necessary. For the first few days after the initial anointing with oil there should be no undressing of the baby, the only handling being that necessary to change the gauze diaper. The clothing should be the simplest possible.

In general the most satisfactory means of administering the food is to use a Breck feeder. The mixture of breast milk which is generally employed in the premature wards of the Bellevue Hospital is, for the first few days, one half whey and one-half breast milk, the mixture being given every one and one-half or two and one-half hours, depending on the size of the baby and its stomach capacity. After a few days the strength of the breast milk is increased to three-fourths, from 1 ounce to 2 1/2 ounces being given seven or eight times in twenty-four hours. Later the breast milk can be increased to full strength and the quantity given in twenty-four hours also increased so that the baby will be taking 3 ounces every three hours.

The number of calories per kilogram required by premature babies is much higher than for babies at full term. In looking through the charts it is found that most of these premature babies do not gain until the calories per kilogram have reached at least 150 and frequently as high as 200 or more per kilogram.

EDWARD L. CORNELL.

Fairchild, W. J.: Asphyxia Neonatorum. *Med. Times* 9, 6, 21, 337

The author's technique is as follows. See that the upper air passages are clear for the entrance of air. Place the infant facing the physician in a slightly inclining backward upright position of the body with his hands supporting the infant's back and head, held just at the right position to favor the most direct ingress of air. Have the nurse at hand with a glass of cold water, the colder the better to give the physician a mouthful from time to time. If the spurs it from his mouth in forceful jets against the front of the thorax of the child, the first time or two even including the neck and face. This water-blowing is continued at the rate of one time



Fig. 1 Tracing of the brim of a Naegle pelvis, history unknown. The appearance over the left sacro-iliac joint region is a mere superficial crack.

in four or five seconds and the respiratory function is a certainty C. D. HOWERS.

Hofmeister M. The Treatment of Asphyxia of the Newborn (*Zur Behandlung der Neugeborenen*) *Monatschr f Geb rsh u Gynack* 1916 xlv No. 4.

Schulze's method of treating asphyxia neonatorum has been the standard method for years. In spite of that fact there are nevertheless difficulties and drawbacks which cannot be denied. The author has discontinued the use of the method more and more and has returned to the old method of insufflation. All theoretic objections cannot detract from the practical value of the insufflation method. The trachea and the larger bronchi must first be cleansed by introducing a catheter into them and aspirating mucus and other fluid. Then a quantity of air is forced into the child's lungs under moderate pressure so that the thorax rises gently. The first noticeable effect is upon the heart action even after a few insufflations. This improves almost immediately and is the first indication that success may be hoped for. The child of course must be kept warm by means of hot towels and a hot bath. If the first active respirations occur one can leave the catheter *in situ* and wait to see whether they will be repeated or whether further insufflation is necessary. Probably only slight compression of the thorax rhythmically will be all that is necessary to help the infant in its fight for life. The only difficulty of the method is the introduction of the catheter especially in very small children. This is not at all easy but the technique can be practiced on the dead and it is surely not more difficult to learn than the Schulze swinging. L. A. JONES.

Thomas H. E.: Columnar Amniotic Epithelium. *V F M J* 1916 clv oyo.

The amniotic epithelium covering the placenta at term is usually cuboidal.

In a study of 100 placentas Thomas found columnar epithelium in 69 and cuboidal in 31. In 35 cases in which the columnar epithelium was found



Fig. 2 Tracing of outlet of Naegle pelvis. In the middle line from below up is seen the posterior surface of lower aspect of sacrum, promontory to left. Note straightness of left side of pubic arch.

it was determined that the membranes had ruptured one half to three or more hours before birth. In 10 cases in which cuboidal epithelium was found the membranes remained unruptured until birth or one half hour before birth with one exception which is explained by the fact that the amniotic fluid had probably not been entirely drained. The explanation given is that when the liquor amni has drained away the uterine contractions exert a surface compression on the placenta, tending to elongate the cuboidal type of epithelium. With the amniotic fluid intact uterine contractions exert equal pressure in all directions, preserving the cuboidal type of epithelium. With hydramnios and too prolonged pressure the cuboidal type may become flattened.

In two cases where the membranes had ruptured very early both placentas showed many bacteria in the sub-amniotic connective tissue with leucocyte infiltration and erosion of the epithelium.

D. H. BOYD

Hart, D. B.: The Causation of the Naegle and Robert Pelvises, with a Description of One Hitherto Undescribed Specimen of Each. *Edi b M J*, 1917 xviii 4.

The chief features of the Naegle pelvis are shown in Figures 1 and 2. There is an ankylosis of one sacro-iliac joint, a stunting or complete absence of one ala sacri, and an oblique brim.

The Robert pelvis has an ankylosis of both sacro-iliac joints and a deficiency in both ala sacri with great reduction in the transverse diameters and a narrowing of the pubic arch.

The summary of the causation of these types of pelvis is as follows:

The true Naegle and Robert pelvises have not had a previous osteitis with resulting ankylosis in the region of the sacro-iliac joints, followed by disturbed weight transmission.

The pseudo-Naegle and pseudo-Robert pelvises have had a previous osteitis in these regions and the synostosis and atrophy are the result of this.

The forms of the Naegle and Robert pelvises are

the result of polar losses of the size elements of the also sacri and innominate bones due to maturation of the sperm and germ-cells. In these a loss of also sacri and innominate determinants has occurred a great rarity more often a unilateral loss (Naegele) than a bilateral one (Robert).

The sacro-iliac ankylosis is due to the fact that by such losses (body elements and joint elements) the part remaining imperfectly developing becomes ankylosed.

As this is a germ plasmic change and multiplication of the reduced elements occurs, it may be transmitted. D. H. BORN.

Berkley, C. The Importance of Getting Medical Practitioners and Midwives to Co-operate with the Local Health Authorities. *Proc. Roy. Soc. Med.* 9, 6. S. 1, 1917, 10, 6, 1918, 5.

The British Medical Association recommends the following scheme for the establishment of perinatal clinics:

General supervision in such responsibility records and statistics and follow-up of cases to ensure that adequate treatment is obtained. To be undertaken by supervising authority preferably the medical officer of health assisted by nurses or health visitors.

Attendance at a center at which places as may be arranged for the purpose of giving advice and deciding if treatment is necessary. Of the treatment at this center of a selected number of cases as may be determined upon by the local authority. This work to be undertaken by all those local practitioners who are prepared to do it. Such practitioners would be required to attend at the center arranged place for a specified time on certain days at fixed intervals.

3. Treatment of all cases requiring ordinary medical attendance to be undertaken either at the center at the doctor's office at the patient's house or at an institution.

4. All persons referred to the center be allowed to choose the doctor they prefer to consult.

The work of this group of doctors would consist in the examination and advice to expectant mothers and the keeping of such records and the giving of such treatment as is included within the scope of the scheme. The midwives also suggest that the practicing midwife should be included either as a scheme by enlisting her sympathies and securing her services. It is pointed out by those who speak in their behalf that the practicing midwives would get

in touch with the pregnant woman earlier than any official especially as there is certain to be great resistance among people to reporting pregnancy to any public authority. The midwife is often the only consultant of the single pregnant woman and such knowledge is of very great importance in regard to the question of abortion.

Both the general medical practitioners and midwives have no doubt that it would be all for the good if the expectant mother and the nation if antenatal and treatment were more seriously considered than up to the present has been possible, in order to do so by notification of pregnancy would involve these bodies if this was really voluntary. The main object on it is that some of the local authorities who have adopted a so-called voluntary system appear to have tried their best to make it look as much like a compulsory system as possible.

Expectant mothers used to make the necessary arrangements for their confinement much earlier in pregnancy than now since the advent of the Maternity Benefit because they know this money is coming. The present tendency is for them to postpone their attendance till on the average about two months before the confinement.

Until notification becomes compulsory single women will certainly postpone engaging an attendant till the last possible moment and in many cases these are the very women it is important to get hold of. And besides working women nowadays are not going to stand such legislation and they will see to it that the same regulations apply to all classes. I. W. AND L. CORNELL.

Duncan, C. H. A New and Powerful Galactagogue. *N. Y. J.*

In treating acute mastitis by means of autotherapy that is by injecting subcutaneously the milk at the point of discharge from the nipple it was noticed in a child not curing the mastitis quickly that the quantity of milk rapidly increased until it became more than the patient a multipara had ever produced.

This treatment is particularly applicable in cases where the delivery has been recent and in which the supply of milk is quickly diminished.

The technique consists in injecting a few cc. of the mother's own milk into her subcutaneous tissue under strict asepsis. This is repeated if two days and if necessary in five days again. Under ordinary conditions the results are sure.

LEONARD L. CORNELL.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Mayo W J : Removal of Stones from the Kidney
Surg. Gynec. & Obst. 1917 xxiv 1

Four hundred and fifty patients with stone in the kidney were operated on (484 operations) in the Mayo Clinic between January 1 1898 and December 31 1915. There were three deaths a mortality of 0.6 per cent. The results were due largely to careful urologic and roentgenologic examinations. Nine per cent of the patients had stones in both kidneys. The more marked symptoms usually come from the kidney that is least damaged. The smaller movable stones cause exacerbations of infection from obstruction, etc while the larger stones because of their more fixed position may not give rise to severe symptoms even though the kidney may be nearly destroyed.

Stones were found in a few cases of anomalous kidney. When the anomaly was known in advance, operation was easy and gave good results. When not known in advance the operation was complicated by the necessity of establishing the presence of the anomaly before removing the stone. Stones in a single kidney after nephrectomy of the opposite kidney were found in only two instances and good results followed their removal.

Recurrence of stone takes place in not more than 10 per cent of the cases and probably in a much lower percentage if good surgical judgment is used in choosing the proper surgical procedure and carrying it out. A common cause of recurrence is failure to remove all the stones from the kidney at the time of operation. If radiograms were taken immediately after an operation for stones in the kidney surgeons would often find that they had not removed all the stones. If radiograms are not made until some months afterward such findings lead to the belief that recurrence has taken place. Persons with large branched stones in a badly damaged and infected kidney are exceedingly liable to recurrence following a conservative operation and therefore if the remaining kidney is sound there is an increasing tendency on the part of the surgeons to remove such an organ at the primary operation. When stones have been found in both kidneys the better kidney has been operated on first. When the second kidney containing a large branched stone is not infected, delaying the operation until symptoms appear has been advised, since the kidney may be so lacerated during removal of the stone as to make a subsequent nephrectomy necessary or it will be left in such condition that badly drained pockets will quickly reform stones.

Intelligent drainage of the kidney in which there

are both stones and infection will do much to prevent recurrence of stone. Drainage is established through the cortex of the kidney rather than through the pelvis. Pelviolithotomy was done in 206 cases. It is the most generally useful operation. Nephrolithotomy was done in 40 cases. This procedure is not the operation of choice. It is used only for parenchymatous stones and for stones and infection in the calyces when the kidney has been fixed by a previous operation. Combined pelviolithotomy and nephrolithotomy was done in 34 cases and has been found useful. The finger in the pelvis facilitates careful removal of stones from calyces and parenchyma through the cortex. Nephrectomy was done in 204 cases for stone, usually for pyonephrosis complicating stones. In not a single instance in which a nephrectomy was performed was there reason to regret either in the events in the later history of the patient or after examining the specimen that the kidney had been removed while in a number of cases in which a conservative operation had been done the necessity for secondary nephrectomy after some months or years of trouble made it evident that nephrectomy should have been the primary operation.

Krotoszyner M : Radiographic Diagnosis of Hydronephrosis. *Calif. St. J. Med.* 1917 xv 38.

In the author's opinion the nomenclature and classification of this condition needs revision and correction, but with the advances in ureteral catheterization, the injected ureteral catheter and pyelography relief from this chaotic condition is near at hand.

The pyelogram of the normal kidney shows the hazily marked contours and dim shadows of the two perpendicularly located main calyces and that of the small and slit-shaped pelvis which in a smooth line runs into the pelvic portion of the ureter. In beginning hydronephrosis shadows of greater intensity are obtained and sharp pyelographic contours of the pelvic shadows are significant of dilatation. Krotoszyner also claims that of still greater importance is the ureteropelvic anastomosis which in beginning hydronephrosis is marked by a more or less angular contour while the pelvis assumes a sacculated form.

According to Krotoszyner's observations the most important types are

- 1 Dilatation of the renal pelvis alone without that of the calyces. This type is characterized by an enlarged and sacculated shadow of the pelvis around which, laterally, are grouped the small wart like shadows of the various calyces.
- 2 Dilatation of the anatomical pelvis including

that of the calyces. The pyelogram in this type presents laterally from the enlarged and sacculated pelvis—shadow round or berry-shaped shadows of several calyces.

3 Dilatation of the calyces without that of the anatomical renal pelvis. The calyces in this type show enlarged irregularly shaped or round forms while the pelvic shadow appears to be of normal size.

4 Sacculization of the whole kidney (Sackniere). As characteristic pyelographic features of this type, the shadows of the calyces exceed in size that of the pelvis while the connective tissue links between the calyces and pelvis are broadened until in the complete sack-formation of advanced hydronephrosis (Sackniere) one uniform huge shadow comprising the pelvis and calyces appears on the plate.

LOUIS GROSS.

Wohl, M. G. Malignant Papillary Adenoma of the Kidney. *Surg. Gynec. & Obst.* 97 xii 61.

The most common tumor in childhood is the one generally known as Wilms' tumor. Histological sections show a proliferation of epithelium as well as spindle and round cells of embryonal connective tissue type. Striped and unstriped muscle tissues are frequently found.

The most frequent renal tumor of the adult is the Grawitz tumor or hypernephroma. Adams' conception of these tumors as renal mesotheliomas is the most logical of the theories in vogue.

The histology of hypernephroma is considered in detail by the author. True carcinoma of the kidney that originates from renal epithelium are rare. There are only eleven cases in the entire literature of malignant papillary adenoma. In other cases of this type is added by Wohl.

The points of interest in the author's case are the absence of any symptoms or laboratory findings that would point to the genito-urinary tract mass protruding from under the liver in the right hypochondriac region was felt at examination. Liver dullness was two finger breadths higher than usual. Because of a history of jaundice and vomiting this tumor was thought to be a distended gall bladder. At operation it was found that the mass previously felt was the kidney from the upper pole of which the tumor originated. The weight of the renal mass was five and one half pounds. It measured 30 by 3.5 by 1.25 centimeters. The entire tumor mass was covered by dense connective tissue capsules. The tumor almost entirely replaced the kidney substance. The histological examination of the tumor proved it to be papillary adenocarcinoma. After removal of the tumor the patient made a good recovery. No metastasis was found and at present the patient is enjoying good health.

Johnson, F. M. Results Obtained in Lavage of the Renal Pelvis Within the Past Ten Years. *Urol. & C. la. Rev.* 97 xii 3.

The efficacy of renal lavage in pyelitis cannot now be questioned if employed in appropriate cases.

As in all surgery drainage is an important factor and Johnson contends that if we can dilate strictures, overcome obstructions, clear out all debris and pus and leave a clean channel through which urine can pass freely then retention will cease, the inflammation will subside and the patient will get well.

Four cases are reported in detail to illustrate what lavage will do in some of these cases. A large number of cases of chronic parenchymatous nephritis caused by stubborn strictures were cured when the strictures were dilated and lavage of the bladder and kidneys performed. None have had a recurrence.

Johnson points out that lavage should not be attempted where tubercular processes of the bladder are diagnosed. Where disease extends beyond the pelvis of the kidney one must proceed with care.

Very often the diagnosis of renal calculus can be determined by ureteral catheterization, this method being depended upon when X-ray examinations might not be possible. H. W. E. WALTER.

Major, R. H. The Production of Kidney Lesions with Staphylococcus Aureus Toxin. *J. Med. R.* March 10, 1919, 49.

These studies were undertaken by the author to determine what effect repeated injections of staphylococcus pyogenes aureus toxin would have upon the kidneys. The first series of experiments which he reports here was undertaken with the plan of injecting killed staphylococcus pyogenes aureus cultures into animals whose kidneys had already been slightly irritated or damaged at the time the killed cultures were employed. Rabbits were used for the experiments and uric acid was the renal irritant used.

In summarizing the results of these experiments it is noted that with one exception, all the rabbits which were given a preliminary injection of uric acid and repeated injections of staphylococcus pyogenes aureus vaccine developed well-marked kidney lesions. These lesions while not as extensive as those in a great many human cases, yet in principle were the same, consisting of fibrosis, rounded infarction and destruction of glomeruli.

These experiments seemed to the author to show that rabbits, whose kidneys have been damaged with uric acid, show the lesions of chronic nephritis after repeated administration of staphylococcus pyogenes aureus vaccine. It is also noteworthy in these studies that killed cultures produced these lesions. Whether the preliminary damage is necessary he has not yet determined, and experiments directed toward the solution of this problem are under way. GROVER E. BRINT.

Boeckel, J. Spontaneous Traumatic Urostrectal Anus; Surgical Intervention (Anastomose urorectale traumatique spontanée; intervention chirurgicale). *Presse Méd.* 96, p. 530.

Boeckel refers to a case of urethrorectal anastomosis due to a traumatism which had occurred six years

previous, after which the urine passed per rectum. The condition was discovered on the patient's joining the army during the present war and he was recommended for operation.

It was evident that the man had had a rupture of the ureter. On the left lateral wall of the rectum 8 cm. above the anal margin, a small round projecting excrescence was observed in the center of which was a small orifice which scarcely admitted the introduction of the finest sound. To explain the anastomotic infection of the scrotum the penneum and prostate must have been involved. The injured ureter was the primary cause.

The author made a suprapubic incision to draw off the urine and effect retrograde catheterization, then divided the perineum to seek the two ends of ureter. The anterior ureter was found blocked at its end a few millimeters behind the bulb. The posterior ureter into which a sound had been passed from the bladder was also obstructed. Bocckel made a total nreterectomy of the two segments and reunited them on the superior wall. The inferior wall was partly reunited and left largely open in the center. The bladder was siphoned. The after course was normal and the patient is in excellent condition.

W. A. BRECKMAN

Pflicher P: Pain Due to Anatomical Deviation of the Ureter. *Lang Island M J* 1917 xi 1

The determination of pain referred to the abdomen or to the back is often a difficult problem. Many lesions might cause it. Nausea, vomiting or frequency of urination so often accompany attacks of colicky pain that they simply tend to confuse the picture. During the past year several cases have been referred to the Pflicher clinic complaining of recurring pain in the hypochondrium and lumbar region often extending downward to the right and left abdominal region. Those patients in whom pus or macroscopic blood or tubercle bacilli have been found in the urine from the affected side have been relatively easy of diagnosis as have also the cases in which X ray has revealed stone. In most of the remaining cases, gall bladder disease, ulcers of the stomach and intestines, aneurisms, spinal disease and tubo-ovarian and uterine lesions can be excluded as the cause of the pain. There remain chiefly the chronic lesions arising from the appendix and a condition frequently mistaken for appendicitis, namely intermittent dilatation of the renal pelvis due to anatomical deviation of the ureter and a small class of cases due to stricture of the ureter and perinephritis. The acute inflammatory lesions are not easily confused with any of these disorders. The cases of anatomical deviation of the ureter include chiefly those due to high implantation of the ureter into the renal pelvis, twists and kinks of the ureter due to undue mobility of the kidney and the first portion of the ureter and a very important class of cases in which a set of aberrant blood vessels cross the ureter and enter the lower pole of the kidney and form a loop over which the

ureter bends and becomes obstructed. The diagnosis of such a condition can be made before operation with considerable exactness, but oftentimes it involves an extended study of the case. The principal aids to diagnosis are urinary analysis, the cystoscope, the ureteral catheter, the X ray and pyelograph. For the exclusion of intestinal lesions, the stomach tube, the bismuth meal, the bismuth enema, and X ray of the stomach and intestines are very important.

Five cases are presented illustrative of the means employed to make the diagnosis of anatomical deviation of the ureter. Three were uncomplicated cases, the fourth was complicated by prolapse of the cecum and dilated caput. All were successfully operated on and relieved of their symptoms. The fifth patient presented symptoms similar to those found in cases of intermittent dilatation of the renal pelvis but by the use of the diagnostic methods noted above the lesions were located in the appendix and the left uterine adnexa. In this case the radiographs of the kidneys and the pyelograph were normal. The pyelographic findings in all cases were of the greatest importance in arriving at a diagnosis. The pelvis is always dilated in the pyelogram. The picture of a typical egg shaped pelvis is pathognomonic of an intermittent hydro-pelvo-renalitis, due to a constriction or to aberrant blood vessels. None of the calyces are visible because the relaxed walls of the hydronephrotic sac are not distended to their full capacity. The first four pyelograms showed dilated pelves, the first two of which had the typical egg-shaped pelvis. The last case showed a normal pyelogram. The author emphasizes the fact that the diagnosis of pain due to anatomical deviation of the ureter can rarely be made from a consideration of the clinical symptoms alone or by the aid of examinations made in the laboratory. One must depend more upon the various mechanical aids such as the pyelograph and the cystoscope, basing the final judgment however on the combined evidence collected from interrogation of the patient, a personal examination of the patient, the laboratory reports and the interpretation of the scientific aids to our special senses: the cystoscope and the X ray.

C. R. O. CROWLEY

BLADDER, URETHRA, AND PENIS

Stevens, A. R.: Study of Exstrophy of the Bladder. Report of a Case Five Years After Implantation of the Ureters Into the Rectum. *Surg., Gynec. & Obst.* 1916 xxiii, 702

The author summarizes the reports and methods of operation on exstrophy of the bladder, reviews a very large percentage of the work which has been done for these conditions, and tabulates sixteen cases which have been reported since Buchanan's last report on the Maydl operation. The author then reports his own cases as follows:

A Jewish boy, aged sixteen years, undersize, was first seen in February 1911. He had had three

unsuccessful attempts to close the extrophied bladder. Urine caught from the bladder contained a few pus-cells. All other findings were negative. The operation was performed April 6, 1911, under gas and ether anesthesia. A rosette of bladder wall, including the muscle, was dissected free about each ureteral orifice. The ureters were freed high enough so that they could assume the straightest course from the base of the pelvis to the rectum. The left ureter was accidentally broken into early in the operation and the rent promptly sutured. A curved artery forceps was introduced in the rectum. On the tip of this a small opening was made in the left anterolateral rectal wall two or three centimeters above the internal sphincter. The forceps were made to protrude to grasp the edge of the bladder wall at just the left ureteral orifice after the catheter had been removed. With this draw the rectum well into the rectal lumen. Similarly the right ureter was placed in the rectum. No suture was taken in the rectal wall. What would have been easily of the bladder wall was removed.

Ten days after the first operation there was definite urinary leakage again. The fistula was completely healed four weeks after the operation. Because of the tenderness of the mucous membrane a second operation was performed May 18, 1911. The mucous membrane of the penis and the more exposed bladder membrane was sutured. The deeper part of the latter was not removed.

The patient is now practically normal with the kidneys functioning normally. The patient is at work in perfect health and is changed from a wretched dejected lonely boy to a happy lad.

The author lays particular emphasis on careful examination of the condition of the kidneys before operation. A study of the urethra for calculus and lays emphasis on the fact that every operation for extrophy of the bladder should aim at the closure of the urethra. He prefers Bergenhem's modification of Maydl's operation as the best yet described. The preservation of the ureteral orifice is always worthwhile and the author thinks that possibly this will be the method that will finally prevail where the ureteral orifice is imbedded within the bowel wall. Finally he has found a report of case of double uretero-intestinal transposition living over thirty years excepting those that retain the ureterovaginal union. There are at least twenty-seven such cases including the author's case following the Maydl and Bergenhem methods and their modifications. A case is well seventeen years after Maydl operation. (A. C. STOKES)

Alfaro, J. M. S. Two Cases of Vesical Tumors Extirpated by the Hypogastric Route. (Dos casos de tumores en la vejiga extirpados por la talla hipogástrica.) *Anal. de la p. d. S. J. d. Cost. R. I. d.* 9, 6, 11.

The author reports two cases of extirpation of bladder tumors in patients of 35 and 50 years

respectively. The same procedure was followed in both cases. The patient was placed in the Trendelenburg position and the bladder opened along the anterior face. Both tumors were found to be pedunculated.

A Gayon pedicle forceps was adjusted on the implantation of the tumor four threads of No. 0 catgut were inserted 3 cm. below the clamp the tumor was then cut away with curved scissors and the sutures knotted. Hemorrhage was insignificant. The bladder was closed by a double row of sutures, followed by suture of the external wound, a permanent sound was introduced and left for eight days. In both patients the bladder wound healed by first intention.

As a complication in one patient there was a slight secretion beneath the superficial skin suture which yielded to hydrogen peroxide lavage.

W. A. BROADWAY

Kretschmer, H. L. Cystography; Its Value and Limitations in Surgery of the Bladder. *Surg. Gyn. & Obst.* 9, 6, 1911, 700.

In this article the author gives his personal experience with this new method of diagnosis. The technique employed in this series of cases is briefly considered. This method consists in filling the bladder with solution of either argentic or silver iodide or thorium nitrate and then taking a roentgenogram. Many interesting observations are recorded.

From the cystographs obtained in normal cases, the author believes that the internal sphincter closes the internal orifice. One of the interesting phenomena observed was that the fluid placed in the bladder in some cases passed the ureteric sphincter or valve and regurgitated into the kidney pelvis. This was noted in children as well as in adults, who were free from pathological changes in the urinary organs. This phenomenon was also noted in cases in which pathological changes were present in the bladder such as hypertrophy of the prostate or structure of the vesical neck, tuberculosis, etc.

By this method the author was able to demonstrate dilatation of the ureter in many cases in which the ureteral orifice appeared normal upon cystoscopic examination. Various filling defects due to lesions of the pelvic organs in women, are illustrated such as bladder changes due to fibroids, carcinoma of the uterus, parametritis, etc. Filling defects due to tumors of the bladder are also shown.

In cases of carcinoma of the bladder two types of cystographs were obtained. In one group and by far the larger of the two, an irregularity in the bladder outline was seen. This has been interpreted as being a filling defect. In the second group of cases the outline was normal but there was noted a difference in the density of the shadow. The center was lighter than the periphery as though the tumor by its protrusion into the bladder cavity prevented the same volume of fluid being present in the center as at the periphery.

The author calls particular attention to the dangers of misinterpreting the cystographs which in time might lead to making a wrong diagnosis, showing by his illustrations that cystographs appearing identical have been produced by different lesions. He furthermore calls attention to the fact that the cystograph should always be used supplementary to cystoscopy and never instead of it. He comes to the following conclusions:

1. Cystography is a valuable adjunct to our present diagnostic methods

2. Cystography will always have a limited field of usefulness.

3. Great care must be used in interpreting cystographs

4. Because of its limitations and possibilities of misinterpretation cystography can never hope to take the place of cystoscopic examination but should be used as an adjunct to it and not instead of it

5. Cystography may be of aid in determining whether resection or fulguration should be employed in a certain percentage of papillary tumors

6. For outlining the number, size and position of diverticula cystography is easily the method of choice

Begg, C. L. Organic Stricture of the Urethra.
Am J Surg 1916 xxx 389

Begg defines organic stricture as a permanent obstruction of the urethral canal due to plastic changes in its wall. Urethritis is given as the cause in 90 per cent of cases and trauma in 10 per cent.

In the traumatic stricture caused by rupture of the urethra the extent of the development of fibrous tissue depends on the distance between the severed ends of the canal and on the subsequent destruction of tissue by necrosis or sloughing from infiltration of septic urine and varies from a thin fibrous band involving only the mucous membrane to large masses of thick, tough tissue involving the mucous submucous and periurethral areas or even the perineum and skin. In the gonorrhoeal variety the anatomy seems to determine the locations of the strictures. The normal dilatations found at the bulb and at the fossa navicularis provide small recesses, as does the bend at the penoscrotal angle where the gonorrhoeal discharge may lodge thus producing greater inflammation in these localities.

The work of Wassermann, Finger and Guyon has demonstrated that the pathological changes are found primarily in the glandular and penglandular tissues and that the subepithelial tissues are invaded through these. Harrison's view is that the fibrosis begins from an erosion which allows extravasation of urine and septic products into the deeper tissues which results in round cell infiltration. The author concludes that both of these theories are correct.

Many cases of chronic gonorrhoea do not go on to stricture formation, while others of recent origin develop severe stricture. Individual idiosyncrasy as

well as the virulence of the organism has an influence on stricture formation. Severe infections with excessive chordee produce erosions and ulcerations which pave the way for future infiltration. The infrequency of the bad types of stricture as compared to the large numbers formerly observed in the author's opinion is due to the better treatment given these cases. The pathology is better understood and patients have come to realize that gonorrhoea is a serious disease which should have proper treatment. Strong solutions have been discontinued in favor of the milder silver salts which are non irritating and do not favor stricture formation.

Three methods of diagnosis are employed (1) sounds (2) bougies à boulie and (3) the urethroscope. In the author's experience the flexible bougie à boulie is the most satisfactory instrument. In the use of this instrument three normal obstructions are met (1) at the internal meatus (2) at the posterior layer of the triangular ligament and (3) at the anterior layer of the triangular ligament. When more than these three normal obstructions are found a diagnosis of stricture of the urethra may be made.

Two methods of treatment are now in use (1) dilatation or (2) some form of cutting operation. Decision as to the method required by a given case demands a nicety of surgical judgment which is the keynote to success. In the author's opinion operation is indicated only where dilatation is impossible or in cases of resilient stricture which recontract in spite of dilatation or in the presence of sepsis or infected urine which make operation imperative. Fibrosis rather than the caliber of a stricture is the author's guide to operation.

1. Dilatation is performed by means of (1) filiforms (2) silk woven flexible bougies (3) metal sounds and (4) expanding dilators. In any sort of dilatation the result is obtained not so much by mechanical stretching as from the production of a temporary anemia followed by a hyperemia which carries away the products of inflammation. Dilatations should not be too frequent and the author thinks the sittings should be from three to ten days apart. Three essentials to the successful passage of an instrument are asepsis, thorough lubrication and gentle manipulation. In strictures below 16 F the author advises flexible instruments except where filiforms can be followed by the Gouley type of tunneled sound. Strictures above 16 F should be treated with sounds or dilators. The author uses sounds until the stricture has been dilated to the size of the meatus then the expanding dilator is employed.

2. The author advises operation (1) when the stricture occurs near the meatus, including the congenitally small meatus (2) in the resilient strictures which habitually recontract to their former caliber after dilatation (3) in the traumatic variety which usually are hard and tense requiring force to pass through them (4) in those cases with septic infec

tion of bladder or kidneys demanding removal of the offending sepsis and (5) in those cases complicated by extravasation of urine which require operative measures for relief. The choice of operation depends upon the location and permeability of the stricture.

Internal urethrotomy is advisable in all strictures anterior to the bulb. Strictures occurring within one inch of the meatus can be operated through an urethral speculum. A urethrotome is used for the strictures between the bulb and the first inch of the meatus. These instruments are not suitable for the deep strictures unless an external operation is done at the same time. External urethrotomy is accomplished in two ways with a guide and without a guide. When a guide cannot be passed, or when retention or sepsis necessitates an emergency urethrotomy the operation must be attempted without a guide. Cock's operation was originated for cases of acute retention in impassable strictures. Suprapubic cystotomy and retrograde catheterization are occasionally done. Urethrectomy is attempted in some cases, but it is not advisable when a fibrosis extends over 25 mm in length. The most frequent operation consists in the insertion of a sound to the stricture and the incision of the urethra at this point. By careful search with a probe or filiform the urethral opening can be found, after which a grooved director is passed and the scar incised. Through a perineal incision H. H. Young enters the stricture from behind. In the author's opinion, no operation offers more brilliant immediate results than external urethrotomy.

The conclusions are as follows:

1. Urethritis is the cause of organic stricture in 90 per cent of the cases. The careful treatment of this disease from its inception, especially avoiding the use of strong irritating injections or irrigations, tends to lessen stricture formation.

2. The early recognition of inflammatory infiltrations and the treatment of these before fibrosis takes place, prevents the formation of bad forms of organic stricture so common in the past.

3. The flexible bougie à boule is the most suitable instrument for detection of the number, location, and character of strictures.

4. Gradual dilatation is a method of choice in the treatment of stricture in the vast proportion of cases.

5. When a stricture is undilatable or when sepsis, retention of urine, or extravasation make operation obligatory no amount of time, labor and patience should be spared to accomplish a passage of the guide prior to operation, thereby preventing the injury produced by long anesthesia on the kidney which is frequently already damaged.

6. When a filiform cannot be introduced the use of methylene blue solution is of marked service as an aid in finding the opening in the strictured urethra.

Postoperative dilatations are necessary over a long period of time to prevent recontraction.

GILBERT J. THOMAS.

Smith F W. Stricture of the Urethra from Extra-urethral Causes. *Am. J. S. & G.* 96 xxx, 304.

The author discusses a few of the extra-urethral causes of stricture, and cites cases illustrating the various types. The scope of the topic being so wide the author does not attempt to detail all the various causes but mentions only the important ones, as (1) spasms of the muscles in and about the urethra, (2) extravasations of blood or urine from injury or other causes, (3) purulent collections and inflammations, (4) neoplastic formations, (5) fractures of the pelvic bones and (6) growths situated within the capsule of the prostate gland.

He finds that spasm is due to (1) diseases of the prostatic urethra, (2) reflex irritation from more or less remote pathological lesions, (3) organic disease of the central nervous system, and (4) emotional excitement. Except in organic disease of the central nervous system spasm is usually intermittent.

Traumatic strictures are most frequently situated at the triangular ligament and may be the result of a slight injury. They are always composed of scar tissue the extent depending upon the degree of destruction of the urethral walls, the distance between the ruptured ends, and the subsequent destruction of tissue by necrosis from the injury or sloughing from septic complications. These are the worst types of stricture and usually require operation.

In the author's experience traumatic stricture may occur in the anterior urethra and may be due to slight injury. Injuries so slight as to have been long forgotten may eventually result in the formation of stricture. The author favors immediate perineal drainage and external urethrotomy in traumatism to the urethra.

In the prostatic area the author finds the urethra compressed from enlargements or inflammatory disease by new-growths, and by contraction of the prostatic capsule resulting in stenosis of the urethra. Localized scleroses or perleurethral plaques, together with chancres and chancroids may produce stricture.

Penurethral inflammation may occur in various forms as abscesses, fibrous masses, gangrenous inflammation, or extravasation of urine. Abscesses may cause varying degrees of stricture. These are usually situated in the penile urethra. Those of the bulbomembranous portion may develop in relation to the perineum or scrotum.

Sarcoma and epithelioma may cause narrowing of the meatus. Sarcoma is rare but epithelioma develops frequently in the presence of phimosis and commences on the foreskin, glans, or in the urethra. Sarcoma usually appears as a tumor in one of the erectile bodies.

Regardless of the cause, secondary changes occur in all forms of stricture as dilatation and chronic inflammation of the urethra, hypertrophy of the walls of the bladder with residual urine, cystitis, and stone formation dilated ureters and pelvis of the kidneys, and infection.

The author concludes by saying that stricture is

more commonly the result of internal causes than external but that the secondary changes are much the same in either case. In consequence, the importance of recognizing and treating strictures of any caliber and from any cause seems apparent

GILBERT J THOMAS.

Barney J D. An Operation for the Relief of Epispadias in the Male. *Surg Gynec & Obst* 1916 xxiii, 594

A line of incision is made through the glans penis to prolong the urethral gutter to its end. The groove is kept from reuniting by means of drains, preferably by rubber tissue which remains in place until the mucosa has covered the raw surfaces.

A transverse buttonhole incision is made through the prepuce just below the frenum and extending laterally nearly to its ends. This flap is brought forward and forms the roof over the urethral gutter. A fold of the public skin forms the roof of the urethra at the root of the penis.

The entire operation may be done at one sitting. It is better, however, to allow an interval of two or three weeks in order that the newly formed urethra may be covered with the mucosa. In the adult the operation may be done under local anesthesia.

H. A. KRAUS.

GENITAL ORGANS

White E. W. Symptoms of Seminal Vesiculitis. Indications for Operative Interference. *Illinois Med J* 1916 xxx, 400

White goes carefully into the symptomatology of seminal vesiculitis, and says that the wide degree of variability of symptoms is due to the fact that vesiculitis in the true sense has no distinct entity but is virtually associated with a prostatitis, a folliculitis or a posterior urethritis. He says that in 90 per cent of his cases the nervous symptoms were well marked and of long standing the patients being highly neurotic. He attributes this to the wear and tear of persistent pain. The results of treatment in these cases have not been particularly satisfactory. Bladder and urinary symptoms are common and are easily accounted for by the anatomical proximity of the vesicles and bladder. Symptoms referable to the penneum are exceedingly common in this disease. Various sexual symptoms such as hemospemia and pyospermia, together with distinct diminution in sexual strength and finally absolute loss of erection or impotency are not uncommon. Abdominal symptoms are not uncommon in vesiculitis and may be explained by the fact that the vesicle is partly covered by the pelvic peritoneum. Rectal and anal symptoms have also been noted. White divides these according to the results of rectal examination into

1 The acute catarrhal type, in which the vesicle may be soft and almost lost in the folds of the rectum or greatly distended tense and tender

2 The fibrous or sclerotic type

3 The suppurative type or abscess cavity

4 The pan-inflammatory type in which the prostate and vesicles are matted together in one composite mass of inflammatory tissue, with hardly a vestige of normal conditions remaining

In White's experience, rheumatism or joint symptoms have been very uncommon which is contrary to the experience of most other writers

Operation should be performed for (1) relief of pain (2) the evacuation of pus (3) the removal of hard indurated fibrous vesicles of long standing and productive of much discomfort.

The rule advocated by Schmidt that no undue haste need be exercised in advising operation until all palliative measures have been fully exhausted should be religiously followed.

Vesiculectomy has been the operation of choice in long standing cases with sclerotic vesicle whereas, vesiculectomy with drainage has been entirely satisfactory in pus cases and the acute catarrhal forms.

White reports seven cases all of which were operated upon, and which were apparently successful for the short time which they were followed after operation

J D BARNEY

Waddell J A. The Pharmacology of the Uterus Masculinus. *J Pharmacol. & Exp Therap* 1916 ix 171

Waddell reports the results obtained with the excised uteri masculini of rabbits. The drugs used were epinephrine pilocarpine arecoline nicotine atropine hydrastis ergot, pituitary extract and barium chloride

The freshly excised uterus masculinus of the rabbit, he states, exhibited spontaneous rhythmic contractions when suspended in oxygenated Ringer's and Tyrode's solutions at body temperature. Tyrode's solution he found the more favorable medium.

The uterus masculinus of the rabbit exhibited increased tone when in contact with epinephrine pilocarpine arecoline, nicotine, ergot hydrastis, pituitary extract and barium chloride.

The increased tone after epinephrine, nicotine, pituitary extract and barium chloride was accompanied by a decrease in amplitude.

Atropine antagonized the effects of pilocarpine, nicotine and arecoline on the uterus masculinus.

The uterus masculinus he concludes, reacts to drugs in general essentially like the uterus of the female and the reactions to nicotine pilocarpine, and atropine convinced him that the uterus masculinus of the rabbit possesses a motor parasympathetic as well as a motor sympathetic nervous apparatus.

GEORGE E. BELLAY

Waddell J A : The Pharmacology of the Prostate. *J Pharmacol. & Exp Therap* 1916 ix 179

Inasmuch as in an examination of the literature relative to the pharmacology of the prostate the author did not discover a single reference to its response to drugs he decided to carry out this study

He reports the results obtained with the excised prostates of rats, guinea pigs, cats, dogs, and rabbits. Only the posterior lobes (whole) were studied in the case of the rats and guinea pigs, while both longitudinal and transverse sections from the organ were employed in the case of the other animals. The drugs used were epinephrin, pilocarpin, arecoline, tropine, nicotine, and barium chloride.

From study of this data, it is seen that the musculature of the prostate gland resembles in its response to drugs the vas deferens and the seminal vesicle rather than the rabbit (least) the uterus masculinus. Further, it appears to possess, pharmacologically like the other portions of the internal genital tract which have been examined, a motor parasympathetic as well as a motor sympathetic innervation. The former has more powerful control over the organ, the author states and does not relinquish its vitality as indicated by its long retention of function in the excised tissue while the latter apparatus is only feeble in its control of the organ. Pilocarpin produces a constriction of the organ in proportion to the weight of the excised tissue.

From his study the author makes the following summary:

1. The prostate muscle of rats, guinea pigs, cats, dogs, and rabbits did not exhibit rhythmic contraction spontaneously when suspended in a physiological saline.

2. Epinephrin and barium chloride produced an increase in tone in the prostatic musculature of all the animals examined. In rabbits this was accompanied by rhythmic contractions.

3. Pilocarpine and arecoline produced in the prostatic musculature of the rabbit a rise in tone which was accompanied by rhythmic activity. These drugs were not effective in the case of the other animals examined.

4. Atropine antagonized the effect of pilocarpine and arecoline on the prostatic musculature of the rabbit.

5. Nicotine produced an increase in tone in the prostatic musculature of rabbits and cats.

6. The prostate gland of the rabbit at least the author concludes, possesses pharmacologically a motor parasympathetic as well as a motor sympathetic innervation. G. OROG E. BIRLS

Townsend W. W. Obstructive Calculous Prostate. *Surg. Gynec. & Obst.* 9: 6, xxii, 685.

The author describes three personal cases of calculous prostate producing urinary obstruction and reviews the reports of previously published cases. The type of case to which he refers is that in which the calculi are formed within the prostate itself and not those of secondary prostatic calculus in which a renal or vesical calculus becomes lodged in the prostatic urethra.

In none of the author's cases was it realized that the prostate contained calculi before operation, as they could not be detected by palpation nor did the

study of the urinary sediment give a clue to their presence. The principal symptoms were those of urinary obstruction with difficulty of catheterization, evident contracture of the bladder neck, and in one instance hematuria. The author suggests that a routine X-ray examination of the prostate in cases of this type would result in more frequent recognition of the presence of calculi before operation. HENRY L. SANFORD.

Wathen, J. R. A Satisfactory Technique for Prostatectomy. *Urol. & Cut. Rev.* 9: 6, xi, 679.

Wathen, Jr., does the two-stage operation. The suprapubic drainage is established under novocain-adrenaline anesthesia. The bladder is distended with boric acid solution on its anterior surface exposed and a silk thread passed through its wall. Then the bladder is emptied and a stab wound about one-third in diameter is made just in front of the guy suture. Through this a Pezzer catheter is introduced and a suture closes the bladder tight around the catheter. The guy suture is carried through the rectum and the skin on either side, and the rest of the wound is closed.

Enucleation of the gland is done under nitrous oxide and oxygen anesthesia. After removal of the Pezzer catheter the finger is introduced in the rectum and the bladder wall stretched; this causes hemorrhage than cutting. The enucleation is begun by introducing the index finger of the ungloved hand into the urethra while two fingers of the gloved hand are in the rectum.

By working the finger upward, at the same time holding the tumor and working toward the gland rather than toward the capsule we find in a short time the right plan of cleavage and but little force is required. This finding of the line of cleavage is the all-important point as regards bleeding.

As soon as the bladder has been irrigated with warm boric solution after removal of the prostate the patient is placed in slight Trendelenburg position. Walker's self-retaining retractor is introduced, and with a special needle a few interrupted catgut sutures are passed which pick up the internal sphincter of the bladder and the capsule and obliterate to a certain extent the prostatic cavity.

A large Frey tube is placed in the suprapubic wound and a catheter is passed from the urethra and prostatic cavity half way up through the Frey tube and there anchored with a ligature.

Many lots of urine gravitate to the base of the bladder while the urine rises up into the tube and then down again into the catheter. Around the Frey tube is placed a heavy rubber dam, fitting tight within which is packed loose gauze.

Patients should be irrigated every hour for the first five hours, and then three times in twenty-four hours. The Frey tube is removed after three to five days. The Pezzer catheter is put back through the suprapubic opening which in twenty-four hours contracts sufficiently to hold it tight without leakage. Then the tube in the urethra is removed.

The details of this technique are not claimed to be original with the author but their combination as described has proved very satisfactory

F E GARDNER

Barringer B S A Technique for Suprapubic Prostatectomy Under Local Anesthesia. *Surg Gynec & Obst* 1916 xviii, 725

The author's method of doing suprapubic prostatectomy under local anesthesia is as follows. One-quarter grain morphine is given one half hour before operation. The bladder is opened by the usual technique under local anesthesia. The opening is made wide enough to admit two fingers. Novocaine one-half to one per cent is used both to anesthetize the bladder and the sheath of the prostate which are thoroughly infiltrated using a four inch eighteen gauge needle. Particular care is taken to anesthetize the portions of the prostatic sheath between the lateral lobes. When this infiltration is completed, the first finger of the left hand is introduced into the rectum. The gloved finger is taken off the right hand after waiting about five minutes and the finger of the right hand tears through the superior wall of the urethra into the prostatic sheath. When the patient feels pain the tearing is stopped and the prostatic sheath further infiltrated. The operation then proceeds with great gentleness, using all the time that is needed, the prostate is shelled from its sheath. If the final shelling out causes too much pain a whiff of gas may be given the patient. The author reports that three patients had slight pain and one had considerable pain

A C STOKES

MISCELLANEOUS

Eisendrath D N and Schultz, O T The Path of Involvement in Ascending Infection of the Urinary Tract. *J Med Res* 4 9 7 xxxv 295

The authors have earned on a very exhaustive study with the purpose of determining the path of involvement in ascending infections of the urinary tract. In a careful review of the literature they draw attention particularly to the work of Mueller on the method of spread of infections within the kidney and they state that their present experimental studies are largely confirmatory of his work. In other words Mueller's work upon the mode of spread of infection by way of the intrarenal lymphatics seemed to the authors to be so convincing that they thought it might be possible to show that infection travels along the lymphogenous route from the bladder to the kidney. A search of the literature revealed the fact that although the state-

ment is frequently made that ascending infection travels upward in the lymphatics of the ureteral wall there was with the exception of the work of Bauereisen Hess and Sweet absolutely no experimental proof

After a very carefully controlled series of experiments the authors are able to draw the following conclusions

Anatomical studies have demonstrated the presence of an anastomosing network of lymphatics in the wall of the bladder and of the ureter communicating above with a similar lymphatic network in the renal pelvis and parenchyma. At its lower end this system communicates also with the lymphatics of the pelvic structures. In both the male and female

Infections of the bladder or lower ureter may reach the renal pelvis or the kidney either by way of the lumen of the urinary tract or by way of the mural lymphatics. Experimental and clinical evidence indicates to the authors that almost complete obstruction to the free passage of urine is necessary for the ascent of infection by way of the lumen of the urinary tract

Experimentally the authors have shown that infection set up by the simple introduction of bacteria into the bladder without injury or without obstruction may pass upward by means of the interstitial lymphatics of the ureter

The degree of involvement following the introduction of bacteria into the bladder depends the authors state upon the virulence of the organism and upon the susceptibility of the animal. The subsequent tissue reaction may remain limited to the bladder and ureter it may pass upward to the tissues of the renal pelvis or even the parenchyma of the kidney itself may become involved, they state

When the kidney tissue is involved in ascending infection brought about experimentally as described the path of travel is from the subepithelial tissues of the pelvis to the kidney by way of the intertubular and perivascular lymphatics

From the kidney the perirenal tissues may become involved through the capsular lymphatics which anastomose with those of the cortex they find and their experimental evidence indicates that in cases of pyelitis and pyelonephritis in the human secondary to infection of the bladder the lymphatics constitute the most important course of upward travel of the infection especially in those cases where there is no hindrance to the urinary outflow

Pyelitis and pyelonephritis not secondary to cystitis, may also they believe be the result of lymphatic transport of infection from the pelvic organs in the male and female and from the lower intestinal tract

GEORGE F BRIDLEY

SURGERY OF THE EYE AND EAR

EYE

Bailey H. Primary Acute Glaucoma. *J. Med. Sci.*
174 171 2.

Bailey finds the disease rare before the age of forty and attributes its increasing frequency with advancing years in part to the increased density of the sclera interfering with the circulation in the vasa vorticosa and in part to the increase in the size of the lens. The distance of one mm. between the edge of the average adult lens and the ciliary processes is not a sufficient margin of security in all cases.

The growth of these structures in later life may so encroach upon this danger zone as to invite glaucoma.

The physiology of normal tension is explained by the direct relation between the blood-pressure in the small vessels of the ciliary processes and the counter-pressure of the aqueous, and Bailey holds that the constancy of this relation is in great part controlled by the sympathetic nervous system. He considers an elevation of the blood-pressure in association with an angiosclerosis of the blood vessels of the ciliary processes an important cause. He regards the interference with the outflow of aqueous through Schlemm's canal an important factor but secondary to changes occurring in the vessels of the ciliary processes.

The early use of miotics is commended but in most cases as preliminary and not a substitute for surgical intervention.

While emphasizing the value of the iridocyclotomy of Lagrange and the corneocycleral trephine operation of Elliot the author considers iridectomy the operation of choice in most cases of acute glaucoma.

Woodruff H. W. Treatment of Penetrating Injuries to the Eyeball. *J. Ophth. & Otolaryngol.*
916 1, 375

There are manifest advantages in dealing with injuries of the eye as a class which are not possessed by many diseased conditions. The etiology is not obscure. The indications for treatment are apt to be definite. There is therefore little reason for hesitancy or delay.

In penetrating wounds there are certain principles which have a general application: (1) surgical cleanliness, (2) removal of foreign bodies, (3) proper closure of wounds.

The normal conjunctiva contains no virulent pyrogenic organisms. The eye cleanses itself by the blinking of the lids and flow of the sterile tears. For infection it requires either diseased conjunctiva

or a lachrymal sac or an infected foreign body. Flying foreign bodies which penetrate the eye are often sterile while some unretained substance which may cause an apparently trivial injury may give rise to the well-known serpyginous ulcer.

Non-infected eyes are treated much as one would prepare an eye for cataract extraction. If they are known to be infected the author treats them more strenuously often using the subcapsular injection of cyanide of mercury. If the infection is confined to the cornea or anterior portion of the eye, this treatment is often successful. If the vitreous is involved in the infectious process, failure is almost always inevitable.

Foreign bodies must be removed as the eye will rarely tolerate their presence.

The eye will however even tolerate copper if it is located in the lens space.

Magnetic foreign bodies, thanks to the X-ray localization and magnet are removable. If they are in the anterior portion of the eye they are easily removed through the cornea. If they are deeply situated they are best removed through a scleral incision.

The author cites three cases showing the value of localization and the technique used in their removal.

After obtaining a full and complete history have an X-ray examination. If positive, have the foreign body localized. Cleanse the field as for a cataract operation. Anesthetize with 4 per cent cocaine and make a subconjunctival injection of 1 per cent cocaine with adrenalin over the site of the proposed incision. Measure the distance from the cornea back to the location of the foreign body and also above or below according to its position. If the field is fairly dry this can be marked by little argyrol. Make a radial incision in the conjunctiva, extra with non-magnetic retractors or with sutures. Make a small radial incision with the cataract knife and enlarge with scissors as necessary. Apply the magnet tip vertically to the opening. Do not disturb the vitreous or ciliary body if it can be avoided. Resect any of the muscles if necessary. They can be re-attached with little difficulty.

Bourdier. Penetrating Wounds of the Ocular Globe; Their Treatment in the Army (Plaies pénétrantes du globe oculaire leur traitement à l'armée). *Presse Méd.* 1916 p. 522.

Bourdier says that the percentage of eye lesions as compared with the general percentage of the wounded has become considerably increased with the progress of the war. From 1 to 1.5 per cent they have increased to 5.7 per cent with trench warfare. Penetrating globe wounds next to contusions are

the most frequent — 174 perforations for 633 ocular lesions observed about 26 per cent

According to Genet's statistics 6 per cent of ocular wounded lose both eyes. In 15.80 per cent the eye is struck. Petit estimates that it is possible to preserve the globe in 26 to 74 per cent of the cases, according to the condition in which it is found. The statistics of the first months of the war do not show any better results. On the contrary from March 1916 to September 1916, among 174 globe penetrations the author has noted 93 cases in which the globe has been preserved and 23 cases in which the vision has been partially preserved.

Late prognosis appears to be more favorable now than in preceding wars. Cosnetatos in his account of the Greco-Turko-Bulgarian War in 118 cases reported 29 complete destructions of the eyes and 17 unilateral destructions. Sympathetic ophthalmia seems to be less manifest now than formerly.

W. A. BRENNAN

EAR

Pierce, N. H. Non-operative Treatment of Otitis Media. *J Am M Ass* 1917 lxxviii, 1

Factors mentioned by the author as influencing the treatment are (1) the location of the area of the middle ear involved that is whether the disease is more or less located in the tube the tympanum or the mastoid (2) the stratum that is involved that is whether it is relatively superficial the epithelial structures being most affected, or the tissue under the epithelium or whether it is the periosteal layer and bone (3) the character of the pathologic process that is whether it is merely a pus-producing micro-organism, being a streptococcus staphylococcus or one of the various forms of diplococci or whether it occurs as a result of diphtheria or scarlet fever or of tuberculosis or syphilis.

Each case must be studied to determine which of the above factors are operating and the treatment is then obvious. Where the tube is the part chiefly affected, the therapy should be directed to the tube and nasopharynx.

As regards the other types non-operative procedures such as cleansing and astringent measures are sufficient so long as the disease is limited to the mucous membrane.

Otto M. Rott

Mackenzie G. W. The Prevention of Chronic Middle-Ear Suppuration. *J Am M Ass* 1917 lxxviii, 8.

Factors which delay healing of the acute condition are the cause of the chronic condition hence these should be ascertained and properly treated if the chronic condition is to be prevented.

The following deterrent factors are mentioned (1) adhesive bands in the middle ear space (2) narrowing of the eustachian tube (3) any obstruction to drainage (4) adenoids and diseased tonsils

(5) nasal obstruction (6) tuberculosis and syphilis (7) any disease of the kidneys heart lungs gastro-intestinal tract or elsewhere which tends to deplete the patient's health.

Otto M. Rott

Harris, T. J. The Radical Mastoid Operation. *N Y St J Med* 1917 xvii, 17

In order to determine to what extent the radical mastoid operation succeeds in accomplishing what it is usually performed for the author asks (1) What is the radical operation? (2) When is it indicated?

The answer is The radical operation applied to the ear means as elsewhere in the body an operation for the radical or complete removal of all disease and is indicated when cure by other measures is found impossible.

From this basis the author has analyzed the results of the operation on twenty-four patients concerning the discharge the hearing the epidermization and the condition of the tube. Concerning the discharge it was found that 48 per cent were perfectly dry and 52 per cent were still discharging. Concerning the hearing it was found improved in only 8 per cent, unchanged in 20 per cent and worse in 20 per cent. Concerning epidermization the ear was found fully epidermized in 14 cases partly in 3 while granulations were found in 5. Two cases were still under treatment though the operation in all had been performed not less than five months previous. The tube was found closed in 11 cases.

As the above statistics represent the work of approximately a dozen operators with large experience the author feels that it is representative of the usual experience.

Two reasons are offered for the failures in so large a percentage of cases (1) Failure in determining the proper indications for the operation and (2) faulty technique in the operation or in the postoperative treatment.

As a result of this investigation the author has drawn the following conclusions:

1 The radical operation is an operation of undoubted merit.

2 It has been in the past and is today being performed often when not called for.

3 The results are by no means uniformly good partial or complete failures occurring in a considerable percentage of cases.

4 Improvement in the hearing cannot be promised. The most that can be offered in the light of our statistics is that the hearing will not be altered although there is sufficient risk of lowering or destroying it to warrant reluctance or refusal to operate in case the hearing in the other ear is destroyed.

5 While accidents including facial paralysis are met with in the course of the operation, they are not of sufficient frequency or significance to have any bearing upon a decision in regard to the operation.

Otto M. Rott

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Shambaugh, G. E. *The Surgery of the Ethmoid Labyrinth*. J. Am. M. A. 9 6 Nov., 90

The method described which is safe simple and rapid consists of three steps

- 1 The removal of the concha media
- 2 Breaking into the bulla with biting forceps
- 3 Removal of the anterior ethmoid cells by means of forceps which cut forward. The median part of the ethmoid is best left in place until all of the cells have been removed. This serves as a protection against encroachment on the meatus nas communis the roof of which is formed by the cribriform plate. Curettes at some times assist as for instance () where because of an unusual firmness of the bony walls it is found difficult to break into the labyrinth with the forceps () to complete a work begun by forceps. The curette should be strong with a blunt point. The author prefers the Whiting mastoid curette.

OTTO M. ROTT

Beck, J. C. *External Frontal Sinus Operation*. J. Am. M. A. 9 6 Nov. 8

As having an important bearing on the surgical procedure demanded, the author mentions the following forms of pathological changes

Simple congestion or acute inflammation of the mucous membrane lining

Simple congestion or acute inflammation of the mucous membrane lining plus acute osteitis, even necrosis

3 Chronic infiltration of the lining membrane with myxomatous degeneration. Epithelium very much thickened with excessive secretion.

4 Chronic infiltration of the lining membrane with myxomatous degeneration. Epithelium very much thickened with excessive secretion plus superficial osteitis.

5 Chronic infiltration of the lining membrane with myxomatous degeneration. Epithelium very much thickened with excessive secretion, superficial osteitis and necrosis even to a degree of sequestration, and in some places there may be ulceration of the epithelium and true granulation formation.

6 Hyperplasia of the lining membrane with very little round cell infiltration, but myxomatous changes to a degree of polyposis. The bone is not changed at all or at most there is a rarefying osteitis.

7 Characteristics of tuberculosis, syphilis, malignant disease and foreign bodies, in addition to the chronic infiltrative inflammation. Bone changes are very common, especially in the syphilitic form

After giving his results with the various external operations such as the Kuhnt Coakley the Killian, the modified Killian and the Lothrop procedures, the author describes his osteoplastic flap operation, naming the following steps

Röntgenogram postero-anterior for proper anatomic outlines.

2 Celluloid model made for tracing the frontal sinus from roentgenogram.

3 Incision through skin and subcutaneous tissue along the upper margins of the eyebrows and these united across the bridge of the nose.

4 Dissection of the skin and subcutaneous tissue flap upward

5 Celluloid model placed over exposed area.

6 Incision through periosteum along the margin of the celluloid model

7 Chisel and burr along this lateral periosteal incision from one supra-orbital margin to the other in the interior of the frontal sinus.

8 Gigli saw engaged in the upper edge of this dissection and brought down to the level of the supra-orbital margin, thus cutting the septum of the frontal sinus, then saw slightly upward to weaken the pedicle

9 Turn this osteoperiosteal flap down. Remove the pathologic tissue but carefully avoid exposure of bone to any great extent

Enlarge outlet of sinus in the nose backward and outward by means of electrically driven burr, carefully avoiding the internal nasal crest by use of Halls protecto

1 Semisolid rubber tube inserted into the outlet one end coming at or near the nostril, the upper end at the beginning of the outlet. Through this tube a strip of prepared gauze is packed the upper end loosely filling in the cavity of the sinus.

Osteoperiosteal flap brought back into position and the skin and subcutaneous tissue flaps brought down and sutured or closed by use of clips.

After-treatment. On the second day remove the gauze on the fifth day the tube. No further drainage is necessary. Subsequently but not before three weeks wash the sinus with normal salt solution, or injection of bismuth paste into the sinus may be done.

OTTO M. ROTT

THROAT

Forbes, H. H. *The Removal of the Tonsil as a Prophylactic Measure*. N. Y. St. J. Med. 9 6, xvi, 580.

The author advocates the removal of tonsils where a diseased condition is in doubt as well as when the disease is manifest because of the im-

possibility in some cases of determining a healthy tonsil from mere inspection.

He believes that tonsil removal is a long step in advance of prophylaxis and preventive medicine.

Otto M Rott

Moffett J J : Tonsillectomy in Adults. *J Med St M Soc* 1917 xvi 17

The author emphasizes the following points

- 1 The importance of the tonsils as a potent etiologic factor in both local and systemic diseases, the following being mentioned cervical adenitis, oft repeated attacks of follicular tonsillitis if one attack of quinsy has occurred certain types of middle ear-disease with or without chronic discharge greatly enlarged tonsils foul breath associated with caseous material in the tonsil crypts new growths either benign or malignant chorea acute chronic metastatic (rheumatic) arthritis valvular heart-disease ulcer of the stomach goiter certain skin eruptions such as herpes zoster urticaria and erythema multiforme after certain diseases wherein the patient through the medium of the tonsil may act as a carrier diphtheria Vincent's angina, etc

- 2 Facts are coming to displace empiricism as an indication for tonsillectomy

- 3 A more concerted effort should be made to establish a specific test for recognizing diseased

tonsils the author's indications being (1) greatly enlarged tonsils (2) enlargement or abscess formation in the lymph-glands draining the tonsillar region (3) history of oft repeated attacks of tonsillitis, (4) history of one attack of quinsy (5) presence of cheesy kernels in the tonsil crypts (6) ability to express pus from either the tonsil itself or the peritonsillar space (7) dusky red color limited to the tonsil or to the margins of the pillars

- 4 Tonsillectomy should supercede tonsillotomy

- 5 The marked safety and other advantages of local anaesthesia.

- 6 The favorable results following tonsillectomy when skillfully performed under the proper indications

Otto M Rott

Green J B : The Use of Tissue Juices for the Control of Bleeding in Tonsillectomy *Laryngoscope* 1916 xxvi 1254.

The author's method is to make pressure into the fossa during the dissection operation by means of the tonsil itself instead of by means of sponges. The reason for this procedure is that by means of this pressure tissue juices are expressed and in accordance with Howell's theory of blood coagulation these tissue juices contain thromboplastic substances which in turn free the prothrombin from the antithrombin of the blood, thus permitting the clotting of the blood

Otto M Rott

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INTERNATIONAL ABSTRACT OF SURGERY

JUNE 1917

ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Cole P. P. The Central Eyed Needle in Surgery
Surg Gynec & Obst 1917 xiv 122

The aim of the central-eyed needle is to help toward improved technique by assisting to reduce handling of needles wound, and ligatures to a minimum. A needle-holder is necessary the jaws preferably being lined with brass or lead. The fundamental principle involved is to enable the return stitch to be made with the same grip that pulls the needle through. With a little practice a ready manipulation of the central-eyed needle may be attained. Its use is not recommended for intestinal suturing as in this case any form of needle-holder is cumbersome and unsatisfactory. The ordinary over-stitch is not used with this needle. Diagrams are given to illustrate a few methods of stitching and the mode of using the needle. The modified continuous Cushing lock, postmortem and continuous Halsted stitches are shown.

CARL R. STEINKE

Hollender A. R.: The Treatment of Stitch Suppuration. *A. M. J.* 917 cv 70.

Stitch abscesses as a postoperative complication are of frequent occurrence, some hospitals even report epidemics. Healing does not always occur spontaneously after the removal of the stitches or by simple drainage without considerable difficulty.

The method of treating stitch suppuration of every variety by injections of bismuth paste is being employed very effectively at the North Chicago Hospital. This method does not differ from the bismuth paste treatment now generally used. A specially devised syringe with a long pointed nozzle similar to that of a hypodermic needle except that

the point is blunt is used to inject a 10 per cent liquefied bismuth paste into the channel left by the suture as soon as it is withdrawn. The paste fills out the entire tract left by the thread and exudes from the opposite opening. Suppuration usually ceases within twenty-four to forty-eight hours. The same procedure is adaptable to infective processes undermining the skin or fascia where not infrequently abscesses form. Healing follows in from one to two days after an injection of the paste. The author has given this treatment a thorough trial in a large number of cases and has met with good results.

Morrison, J. T.: On the Use of Secondary Suture
Brit J Surg 1917 iv 414

A few practical considerations and suggestions are given by the author based on his work at No. 26 General Hospital.

The question of when to institute secondary suture is governed by a bacteriological examination of the wound surfaces. There should be very few organisms, abundant tissue cells of various types, and all cells should stain deeply. This is to be found in at least two successive examinations.

In wounds to be closed the skin edges must be approximated without tension, so as to obliterate dead spaces, make the surrounding skin healthy and the bacteriological test favorable. During the first ten days the skin, unless greatly destroyed, is easily approximated. Afterwards it is increasingly difficult. In difficult cases corsetage or lacing of the wound is advisable. The author uses small calico strips pasted on the skin by spirit glue. All skin disturbances must be cleared up. All tunnels and pockets must be filled up or obliterated beforehand. In bone cavities small drainage tubes are left in

stis this is the only exceptio to the rule. Before suture wait until the wound reaches bacteriological standard.

In preparation, the skin should be thoroughly sterilized by spirit soap and either followed by tincture of iodine or Harrington's solution in order to prevent stitch abscesses. The wound surfaces are to be cleaned with cotton wool or linen threads and sutures. In case of tenso deep mattress sutures are first used. Occasionally under-cutting is useful.

For sutures silkworm gut usually is the most satisfactory. Where the sutures pass on the skin, they should be guarded by rubber tubing. Accurate apposition of skin edges is most essential. Michel clips may be used.

The wound is dressed by gauze wrung out of an antiseptic and the part placed in the position of greatest relaxation. The dressings are changed daily for the first two or three days and then left to several days. Free movement is allowed only after three weeks.

In a series of 4 cases the results were highly satisfactory in about 90 per cent.

In conclusion, Morrison states that secondary sutures is a very valuable method of treatment especially in large flesh wounds. A successful result depends on early closing and the amount of care taken to prevent sepsis and the bacteriological test even though only rough and ready has been found to be a reliable guide. P. M. CRAIG.

Jedlicka, J. Postoperative Haematemesis as Result of Chloroform Narcosis (Postoperative Magenblutung als Folge der Chloroform Narkose). *Cas. p. lek. k.* 9: 6 N. 14.

The author reports the case of a 30-year old virgin who was operated upon for ovarian cyst under chloroform narcosis but had no haematemesis. On the third day after the operation vomiting commenced with the exception of tenderness over the epigastrium nothing abnormal was found. The belief that it was an artiriosclerotic ileus of the jejunum and the duodenum and jejunum in the patient was put in the abdomen, where no improvement set in and vomiting ceased. After twenty-four hours vomiting of bloody masses occurred and after another twenty-four hours death ensued.

At autopsy the gastric and duodenal mucosa were markedly swollen until the opening of the common bile-duct were of pale gray color streaked with yellow. On the posterior wall of the stomach near the pylorus a number of small hemorrhagic erosions were found. The liver was large and showed fatty degeneration. Histologically the heart muscle, liver, gastric and duodenal mucosa the musculature and vessels of the stomach, especially in the yellow streaks showed fatty degeneration. Over the erosions the mucosa was missing to the outer middle layer. The chloroform had caused a fatty degeneration of the organs especially of the

gastric and duodenal mucosa. Through the action of the gastric juice a circumscribed digestion had taken place in the areas of fatty degeneration down to the fatty degenerated blood vessels. It is hardly probable that a hemorrhage occurred from a previously existing ulcer as the erosions were entirely fresh. L. A. JUREK.

Archambault, L. The Hematogenous Invasion of the Cerebrospinal Axis in Poliomyelitis. *Annales de l'Institut Pasteur* 1914, 1: 107-120.

The conclusion that the virus of poliomyelitis first invades the blood stream is based on several observations: (1) Many acute hematogenous infections such as typhoid fever, pneumonia and tuberculosis have effects similar to that of poliomyelitis. (2) In these infections an occasional meningitis occurs. This meningitis is probably an invasion of the central nervous system by the blood stream. (3) Pathological findings in cases of poliomyelitis would indicate primary involvement of the blood stream. (4) The mechanical arrangement of the blood supply of the central nervous system would be especially suitable for hematogenous infection.

As regards the transmission of this disease, the author feels very strongly that some insect acts as an intermediate host. The mosquito should be especially viewed with suspicion also the biting fly and ordinary house fly.

The disease is reached by the virus. The virus of poliomyelitis is carried into the central nervous system through the blood stream and particularly by way of the vertebral artery and the distribution.

The virus exerts its deleterious action upon the nervous tissue in part as the result of local toxemia and in part as the result of ascular disturbances due to direct irritation of the sympathetic apparatus.

Poliomyelitis is an acute infectious and communicable disease of the entire organism but with selective localizations in the central nervous organs. Transmission probably does not occur by direct contact but largely through the intermediate agency of insects having both indoor and outdoor activities.

The incubation period of the disease in man is not positively known and probably shows considerable variations under different conditions.

Poliomyelitis should probably be classed among the diseases common to man and animals.

Until more scientific deductions are available all children of susceptible age in a community should be absolutely protected from insects, the moment that poliomyelitis appears in epidemic form. J. H. SARAZ.

Replög, H. B. Pre-operative Immunity with Statistics. *Hygiea* 1914, 1: 1-14.

During the past ten years Replög has been using a mixed vaccine to confer artificial immunity against putrid micro-organisms as pre-operative

procedure Two to four inoculations are given at four to five day intervals with from three to four days between the last inoculation and the operation The vaccine consists of colon bacilli 200 millions staphylococci—all strains—400 millions streptococci 100 millions and pneumococci—all strains available—100 millions The dose is increased by one half at each subsequent inoculation, the increase depending somewhat on the amount of reaction obtained. Replege reports no ether or postoperative pneumonia and not one wound infection in 95 cases since using the vaccine pre-operatively
CARL R. STEINKEL

ANÆSTHETICS

Seybold J W : Which is the Safer Ether or Nitrous Oxide and Oxygen? *Med Rec* 97 vol 63

The requirements of a perfect anæsthetic are that it be easy to take efficient in action without danger to life quickly eliminated and without toxic after effects. At present no such agent exists but under certain conditions gas oxygen approaches this ideal

Considering the physiological action of ether we find a considerable diminution of the red corpuscles after narcosis the change in the configuration of the erythrocytes indicating the destructive influence of this drug Nitrous oxide on the other hand causes no chemical or morphological changes of any kind but is in the blood merely in the form of a physical solution and permits of only one-quarter as much exhaustion as under ether

Investigators have shown that nitrous oxide gas enters the blood as a gas and is exhaled having the same composition with the exception of the addition of carbon dioxide and can therefore be rebreathed until the accumulation of CO₂ reduces its strength of action It can be eliminated in one or two cycles of the blood stream through the lungs being almost immediately replaceable by oxygen the addition of CO₂ from the expired air being an asset as it is a respiratory stimulant Ether however causes a chemical change of the blood stream and thirty minutes of ether anæsthesia will be sufficient to so saturate the blood stream that the latter will show traces of it for ten days or two weeks

One condition necessary before the nitrous oxide method approaches the ideal is that the anæsthetist should be especially skilled in the use of this individual anæsthetic and with an anæsthetist who thoroughly understands its administration it can be used in any operation
E. K. ARMSTRONG

SURGICAL INSTRUMENTS AND APPARATUS

Nix, J. T. Jr : Blood Transfusion Simplified Deductions from Nineteen Cases, Eleven Human and Eight on the Dog *A O I M & S J* 916 1d 435

The author describes an apparatus which he has used in 19 cases in performing transfusion by the

citrate method It consists primarily of two extra large glass syringes (200 ccms.) one of which contains a per cent sodium citrate and the other is used to aspirate or inject blood.

The citrate syringe is then connected by a small rubber tube to the vertical end of a T tube One arm of the T tube is connected to the transfusion tip of the donor and the other end connected to one arm of a Y tube The other arm of the Y tube is connected to the transfusion tip of the recipient and the vertical stem attached to the other syringe

By pressing on the plunger of the citrate syringe the entire tubing and tips are filled with citrate solution, then forceps are applied to the connections of both transfusion tips Further pressure displaces the piston of the blood syringe and fills it to one eighth its capacity

It is then ready for use the respective veins are exposed and the tips inserted and tied in place The clamp on the donor side is released and blood aspirated to the capacity of the syringe Blood in the donor tip is then displaced by injecting a little citrate and the rubber connection is again clamped The forceps on the recipient side are released and the citrated blood slowly injected This tip is also flushed with citrate and the process repeated *ad libitum*

The advantages claimed are

- 1 The apparatus can be sterilized by boiling
- 2 Paraffin coating of tubes and spraying of tips with ether is unnecessary
- 3 It is simple there being no complicated device for changing the direction of the blood current but by simply applying a clamp to the connection of the donor or recipient tip the current of blood or citrate is changed to the opposite direction
- 4 It can be improvised in any laboratory in a few minutes
- 5 It is inexpensive
- 6 The instrument when disconnected permits of single transfusion by means of the large syringe with the special tips.

LUCIAN H. LARKIN

Analogn: Extension Apparatus with Automatic Joint Mobility by Means of Hydraulic Pressure and an Active Medicomechanical Apparatus for the Bed (Streckverband mit tomatischen Gelenkbewegungen durch Wasserdruck und aktiver medicomechanischer Apparat fuer das Bett) *Z. Nr 181 f. Ch.* 916 N 46 918

After treating 102 fractures of the femur with the Bardenhauer apparatus and 82 with his own apparatus, Ansin concludes that the amount of work as well as the result obtained with the different methods cannot be compared at all The traction counter traction and lateral traction which are absolutely necessary for a good result with the Bardenhauer apparatus are eliminated entirely with his own apparatus The attending surgeon need do nothing but control the position with the tape line to see whether extension has been sufficient or not and

increase the weight accordingly. There is no absolute weight required for setting the fracture right this being controlled by the tape line. Even though there be only a shortage of a half centimeter it will be necessary to increase the weight. If this is accomplished with difficulty on account of poor adhesion tape it can be accomplished by pulling out the thigh board a little more so that the patient hangs on his leg. The pelvic end of the fractured femur should always hang freely in the bed so that a hand may be passed under it. The author now employs the adhesive fluid of Heuser.

The mobility of the knee joint in these 8 fractures is complete and was retained entirely without any medicomechanical means. The last 5 cases which are the most favorable of his cases because they reached him a short time after the injury were again fit for field duty within six to eight weeks. In these the active medicomechanical means usually employed in bed were unnecessary. The quadriceps remained in good condition so that four patients were able to leave the bed without even a cane. This proves that fractures of the femur should reach the hospital as soon as possible. All patients received passive motion from the eighth to tenth day or more after the injury. In none of the cases did an abscess develop. In three cases a deep abscess had developed at entry but this was immediately opened and kept open by means of a drain.

Even the oldest and severest cases which have worn an extension apparatus for over a year are

now walking with a perfect knee joint. The greatest shortening the author noted was 4 cm. in a case in which about 10 cm. of femur had been shot away.

These cases still date from the time when the patients could have the extension apparatus applied only after three to four months after the injury.

It is possible to treat the patients during the first few weeks with a cast and the Bardenheuer extension apparatus. The stiffness resulting is then still removable with passive and active motion. To treat the patient still longer with a cast is deemed inadvisable by the author. For transport purposes the cast is the only practical method of fixation.

The patients soon learn to move their limbs with the apparatus, as early as eight to ten days. If after four weeks fair amount of union has developed the author employs a connecting rod between braces of the femoral frame so that hip and knee joints can be moved by the patient himself and by means of that the entire body.

In all severe injuries with prolonged suppurations the active medicomechanical method is of much value as it is self-evident that the active mobility is more conducive to callus formation, quadriceps atrophy and for the entire musculature than the passive mobility. In severe cases and in emaciated persons it is advisable to have the patient move the healthy limb freely also. By this work in bed the entire organism is strengthened and improved.

L. A. JUNKIN.

SURGERY OF THE HEAD AND NECK

HEAD

Rosenthal Neurotization by Means of Innervated Muscular Transplantations into Paralyzed Muscles in Facial Paralysis. *Zentralbl f Chir* 90 N. 24.

Rosenthal refers to Heinke's method of direct transplantation of nerves into paralyzed muscles, and the transplantation of the hypoglossal nerve into the facial muscles in traumatic facial paralysis. This method has the disadvantage that it causes a permanent lesion of half of the tongue which tends to turn toward the paralyzed side and does not press against the hard palate. Besides the patient cannot pronounce certain consonants. The author's method of treatment is based on the myoplasty recommended by Jannu, Lexer and Kruse for the raising of the angle of the mouth and eyelid. Since Heinke proved that the direct transplantation of a nerve into muscle dependent on the nerve gave good results it is justifiable to expect success from the insertion of an innervated muscle divided transversely in the course of its nerve and muscular fibers, into paralyzed muscle and as a matter of

fact, the experimental results obtained by the author by Erlache, von Harker, Gersuny etc. showed that neurotization occurs.

In his technique Rosenthal first makes an arc incision in the temporal region and after incising the temporal fascia mobilizes from the temporal muscle on the temporal line a muscular strip about a thumb's width and as long as possible. Injury from the temporal nerves coming from the third trigeminal branch is almost impossible since these reach the muscle low down at the back. By a second cutaneous incision around the orbital margin above and downward the atrophying orbicular muscle of the eye is found. The cutaneous bridge between the temporal and orbital wounds is raised up and the temporal strip passed under it after having the extremity divided in halves, and in such a way that the muscle section is directed toward the longitudinal orbicular fibers. The temporal fascia is left united to the muscular strip as it prevents injury to the muscle fibers in manipulation. In the fixation muscle must be applied as directly as possible to muscle without intermediary otherwise the desired action might be obviated, viz. the proflera-

tion of nerve fibrillae from the innervated muscle to the paralyzed muscle. Suture should be lateral and not above the muscular section.

In a similar manner a second operation is made commencing with an incision about the oral angle a masseter muscle strip being used. The muscles which contribute to the raising up of the mouth angle are mobilized through a cutaneous incision in the nasolabial fold. Here, also injury to the nerves of the third trigeminal branch is almost impossible because the masseter nerve reaches the masseter muscle from above and to the back. In fixation we should not as recommended by Krause leave any maxillary periosteum attached to the masseter but should obtain the closest possible application of muscle to muscle.

The first signs of success cannot be expected till the lapse of three to four months. The author has operated in four cases. He has observed contem poraneously with mastication movements muscular contractions of the lower lid also contractions in the temporal muscles. The cheek has preserved its tone. When the face is in repose facial paralysis is no longer recognized. The dribbling of saliva has ceased and speech is normal.

Quite differently from the myoplasty of Lexer and Krause, raising of the mouth angle and of the lower lid is not effected immediately after operation but is late and gradual. W. A. BRENNAN

Schaeffer, J. P.: Further Observations on the Anatomy of the Sinus Frontalis in Man. *Ann Surg Phila* 1916 lxxv 665

In an earlier article the author has called attention to the variations in the size and shape of the adult frontal sinus. Bruehl found that the capacity of the combined sinuses varied from 6 to 16 ccm. The author has recently encountered two cadavers in one of which the sinuses had a capacity of 38 ccm. the other of 45 ccm. In both cases finger like processes had hollowed out the frontal (vertical) part of the frontal bone to an unusual degree. Agenesis of the frontal sinuses is very unusual, according to the author's observations, and errors have been made in assuming that the sinus was absent in cases in which no pneumatization of the vertical portion occurred, while in the horizontal part hugging closely to the ethmoid labyrinth and extending far back into the roof and wall of the orbit a roomy sinus might have been found.

Clinicians must bear in mind the great variations to be encountered in the size of the frontal sinus. Duplication and triplication is common. The diseased sinuses may be in the dorsal portion of the frontal bone. GATWOOD

Lyons, C. J.: Ankylosis of the Jaw. *J Am Jt Ass*, 1917 lxxviii, 174.

In discussing the etiology of ankylosis of the jaw Lyons states that the predisposing age is from one to ten years and that trauma has been the primary

cause in the greatest number of cases while scarlet fever otitis media dento-alveolar abscesses and gonorrhea also play a part in its production.

Pathologically the cartilage is gradually transformed into a vascular or fibrous or fibro-osseous tissue the joint cavity is traversed by dense fibrous bands and in the more severe cases this is converted into a mass of spongy bone.

In speaking of the differential diagnosis Lyons says there will always be some movement of the joint especially lateral movement in fibrous ankylosis while in bony ankylosis the only movement observed is the limited movement of the elastic portion of the structures involved.

The treatment consists of operation and the one that has given the best results is similar to that reported by Lillenthal in which a section is removed from the condyle and fascia interposed between the ends of the condyle.

He describes the operation in detail with the after treatment and points out some of the dangers disadvantages and complications. D. L. DEZARD

Brandes Treatment of Cranial Wounds. *Deutsche Med Wkschr* 1916 No 23

Brandes notes that the numerous publications on gunshot cranial wounds show a great diversity of opinion as regards treatment especially as to wounds with arrested projectiles.

Many surgeons proceed only on the basis of their personal observations which are few. Some have abandoned conservative treatment and undertake operations varying from simple and superficial interventions to radical measures others limit their operations to selected cases.

Brandes' experiences in the last Balkan War and in the present war have led him to proceed approximately according to the ideas of Holbeck and of Oettinger i.e. conservative treatment at first in wounds by arms of small caliber and radical intervention in the case of shrapnel wounds and to abandon this rule only in certain select cases. His conclusions are summarized.

1 In the indications for operative intervention in gunshot wounds with projectile arrested in the brain (not in the cranium) we must clearly distinguish between projectiles of small caliber and those of artillery.

2 In case of brain lesions from small caliber projectiles operation is performed only when there is evidence of beginning infection or progressive manifestations of cerebral compression which call for intervention. Otherwise conservative treatment proceeds as advised.

3 In shrapnel or grenade wounds with arrest of the projectile in the brain the author intervenes at once unless there is small probability of being able to immediately remove the projectile. He cannot confirm either by his own observations or from autopsies, Holbeck's idea that in shrapnel injuries with the projectile arrested in the brain the projectiles exhaust their force in traversing the

skull capping since the bullet is often found at a depth of 2 to 3 cm. in the brain.

4. Bier's method of causing the bullet to fall by blows against the head did not succeed in three cases in which the author tried it.

5. Various theoretical considerations also militate against the probability of this method succeeding, besides it cannot be considered harmless, it is less dangerous to intervene with the gloved finger to reach the bullet and then extract it.

6. If the bullet is not found at a reasonable depth in the brain the author limits himself to tamponing the brain cavity and keeping the external aperture open in case of initial encephalitis. Symptomatic prolapse invites surgery with good prospects, the encephalitis should be treated and the prolapsed pedicles freed by wider removal of bone. The removal of the projectile can be obtained secondarily.

W. A. BROWN

Gunnar K. The Histologic Structure of the Hypophysis and of Hypophyseal Adenoma and Their Relation to Acromegaly (Die histologische Bau der Hypophyse und der Hypophysenadenome und die Beziehungen zur Akromegalie) *Hjg.* 9, 61, 1934.

After a review of the literature of the last 15 years in regard to the histological structure of the hypophysis and hypophyseal adenoma, the author reports his observations of hypophyseal adenoma and acromegaly. The tumors proved to be typical pituitary cell adenomas and showed structure very analogous to that of the gland itself. The individual tumor is identical with the chromophilic principal cells of the gland. No signs of malignancy were present. Even with the use of special techniques of histologic granules could be found. The tumors found described in cases of acromegaly during the last few years have always been the same as this tumor but always showed chromophilic granules. The tumor is not accompanied by acromegaly though it is chromophilic principal-cell adenoma. This observation is certain and confirms the view of Benda and others regarding the chromophilic granules as an active secretion product of the hypophysis and that hypersecretion of this product causes acromegaly. L. A. J. REYNOLDS

Boyd W. A Case Bearing on the Function of the Pituitary Body. *J. Am. Med. Ass.* 9, 1, 1934.

The case reported corroborates in striking manner the evidence histological, anatomical and experimental upon the question of the function of the posterior lobe of the pituitary gland, by which the secretion of the posterior lobe enters the circulation.

The histological appearance of the organ—a non-vascular structure—suggests that absorption is by way of the third ventricle rather than directly into the blood stream. In the human, the infundibular recess of the third ventricle is prolonged into the infundibular stalk which connects the hypophy-

sis with the tuber cinereum. In some animals this prolongation extends directly into the posterior lobe so that secretion may pass readily into the third ventricle.

Experimentally Cushing and Goetsch found that injections of the cerebrospinal fluid of both humans and animals produced physiologic symptoms similar to those obtained with posterior lobe extract (high sugar tolerance, etc.) Goetsch producing a high sugar tolerance by placing a clip on the infundibular stalk in animals.

In the case reported a glioma surrounded the infundibular stalk cutting off its lumen as by a ligature. The patient was a boy 10 years of age whose symptoms were initial headache and vomiting later diminished vision, exophthalmos, and choked disk. At the end of 15 months marked increase of sugar tolerance was found and X-rays showed an apparent enlargement of the sella turcica. Operation disclosed a soft translucent tumor some of which was removed. The patient recovered and was well for three weeks when he awoke followed by coma and convulsions and died one week later. Autopsy showed a glioma growing in the region of the floor of the third ventricle completely surrounding the pituitary body obstructing the infundibular stalk. The author offers the case as an additional argument in favor of the theory that the secretion of the posterior lobe of the pituitary passes by way of the infundibular stalk into the third ventricle.

H. C. BROWN

NECK

Gatlier J. Vascular Wounds of the Cervical and Cervicofacial Regions (Plaies vasculaires des régions cervico-faciales) *Rev. de chir.* 9, 1, 1934.

The author has had occasion to observe a large number of wounds of the cervical and cervicofacial regions, 55 muscular wounds and 6 wounds with severe vascular lesions. In 11 of these cases there were lesions of the carotid trunk or of the multiple and important branches of the external carotid. He has ligated the common carotid ligated the external carotid 5 times, and 4 times one or more of the large branches.

In the treatment of vascular wounds of this kind there are two matters of importance to be considered in the beginning: the first is the organization of the surgical service, the front and the second the anatomopathologic conditions of the injury. The probability of the ambulance to the firing line is of capital importance for the immediate care of these wounds. Of the 11 cases reported 9 were received by the author from one and one-half to three hours after injury.

In wounds of the cervical region properly so-called, not rarely is there much external hemorrhage. More frequently there is found a deep, voluminous hematoma which exerts pressure on the surrounding tissues. Cervicofacial wounds are in the con-

trary usually accompanied by maxillary fractures and muscular rupture and external hæmorrhage is usually very considerable.

Whether the cervical injury has resulted in a tracheal compression due to formation of hæmatoma or whether a cervicofacial wound with maxillary fracture has caused a prolapse of the tongue accompanied by respiratory disturbance a preventive tracheotomy may be the most urgent indication. This procedure was necessitated in 4 of the author's cases and in all cases was done without anæsthetic. When the respiratory rhythm is re-established the patient is then anæsthetized and the required intervention for the vascular lesion proceeded with.

Of the 11 vascular operations 9 recovered 1 ligation of the primary carotid 4 ligatures of the external carotid, and 4 ligatures of the large collaterals. Two patients died one ligation of the primary carotid, and 1 ligation of the external carotid. In this latter case operation was not done till the fourth day and the tissues were found to be infected.

Although the clinical aspect of this class of injury is so dramatic that the prognosis seems very grave yet the best results may be hoped for from intervention if the operation can be done early without haste and with the region largely exposed. Pre-

liminary tracheotomy exposure and examination of the primary carotid and the continuity of the vessels permitting ligation under the best anatomic and physiologic conditions are the elements necessary for success.

W. A. BREKMAN

Lahey F H : Thyroid Abscess; with Mention of Two New Signs of This Condition. *Boston M & S J.*, 1917 clxxvi, 94.

This rare condition has received little attention in the surgical literature. The cases are usually confused with cyst of the thyroid. The author has observed three cases in which, besides the signs of local infection, there were constant characteristic signs which if noted should point to the diagnosis e.g. limitation of chin elevation and depression of the chin toward the sternum when swallowing. The cause of both of these signs is the same e.g. tightening of the muscles overlying the thyroid by elevation of the chin or contraction of the muscles when swallowing. In either case pressure on the abscess causes pain. The patient therefore attempts to prevent this by keeping the muscles from becoming taut. In opening the abscess it is important to cut the fibers of the sternohyoid transversely thus allowing free drainage.

HORACE BERRY

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Oliver J C: Carcinoma of the Breast 41
S & Phila 9 7 lrv 66

Carcinoma occurs about twice as frequently in the stomach as in the uterus and about twice as frequently in the uterus as in the breast. Although there can be no reasonable doubt that part of the apparent increase in cancer can be explained by the greater accuracy of diagnosis at the present time and part by the supposition that some fatal cases of ulcer of the stomach are ascribed to cancer both a relative and an absolute increase in the incidence of cancer must be acknowledged.

An analysis of 100 consecutive cases of carcinoma of the breast taken from the author's private practice show the following results:

In 4 cases the results were unobtainable. Of the others 41 survived the three-year period of freedom from recurrence, and but 3 recurrences have appeared later than this arbitrary limit. Of those living 1 is alive twenty-one years after operation 3 fourteen years 3 fifteen years 1 thirteen years, 1 twelve years 1 ten years 3 eight years 5 seven years 3 six years 3 five years 3 four and a half years 3 four years 5 three and a half years 1 three and a quarter years and 2 three years.

The author's experience with the X ray leads him to the generally accepted belief that it is of little or

no value prior to operation. He is inclined however to look with much favor upon its postoperative use and though his experience is not large, he states that he will continue to recommend systematic postoperative treatment in all his cases. He has had no experience with radium.

GATTWOOD

Sekiguchi S : Studies on Paget's Disease of the Nipple and Its Extramammary Occurrence
Ann. Sw S Phila, 1917 lrv 175

Paget's disease is still of interest on account of the variety of opinions entertained by pathologists and clinicians as to whether it is cancerous or benign. This condition has been regarded as (1) or dinary eczema, (2) irritation by a benign tumor of the breast, (3) epithelial dystrophies by neuritis and perineuritis (4) a peculiar disease, *sui generis* precancerous—psorospermosis, blastomycosis, or degenerative epithelial dermatosis (5) melanoblastoma (6) nevocarcinoma, (6) primary superficial epithelioma, (8) primary glandular-cell carcinoma from the superficial milk ducts.

The author has found reports of over 200 cases in the literature. Thirty of these have been recorded as extramammary Paget's disease including lesions of the back nose lip and genitalia.

The earliest symptom appears usually as a pimple, a crack, a red patch, a scab or an excoriation. Paget distinguished two general types one, weeping

exematous, the other dry psoriatic. These may be mixed. Often a burning and tingling sensation is complained of but rarely pain. The borders are always well defined, and according to some authors this is the only diagnostic sign by which it can be differentiated from ordinary eczema.

From a study of the pathology of eighteen cases observed by the author it seems that in the paid rmls two processes take place—the one a thickening, the other a destructive. The thickened part surrounds the edges of an ulcerated area and shows proliferation of the malpighian layer. The thinning is usually at the expense of the cornified or granular layer. In both places peculiar large and clear cells so-called Paget cells, are seen. These cells have a homogenous cytoplasm in which the cell is one or two nuclei. Karyokinesis may often be observed. No epithelial fibrillation and no prickly sensation are visible. Elastic particles are not present. These cells are tumor-cells according to the author and do not originate in the local epidermis. The corium is altered by the infiltration of the plasma-cells and the hyperplasia of the elastic tissue. The rows of cancer-cells are sometimes enclosed by an annular infiltration. The subpapillary elastic net which in the normal condition occupies the border of the basal layer is increased and pushed down deeper by the plasma-cell infiltration.

There is sometimes noted in slowly progressing carcinoma a tremendous increase in elastic tissue and it is this same phenomenon which is often so decided in Paget's disease. There is also some displacement of the unstriated muscles, vessels, and nerves by elastic tissue. From the section examined by the author, he is positive that the disease begins primarily in the lactiferous ducts in case of the breast and that the changes are primarily carcinoma. It is analogous to the basal cell carcinoma which does not show distinct malignancy for some time. It is well known that sweat glands and milk glands are embryologically similar and some of the cases already reported have had their origin ascribed to cancer of the sudoriferous glands. From the

author's observations, he is led to believe that Paget's disease is primary carcinoma of the orifices of the lactiferous or the sudoriferous ducts.

GATZWOOD.

Lewis, D. D. Bleeding Nipple, with Plastic Operation upon the Breast. *Surg. Cl. Chicago*, 974, 7.

Bleeding nipples are most frequently associated with intracanalicular papillomata and the adenocystic type of chronic mastitis. The former is more frequent and the majority are benign. These intracanalicular papillomata are usually superficial beneath the areola. The author cites a case in which the tumor was the size of a hazelnut beneath the areola. It developed rapidly and could be partially evacuated through the nipple by pressure which forced out a stream of serohemorrhagic fluid. The bleeding from the nipple in this case had been of eight years' intermittent duration in a woman of 46.

The case presented at this clinic was a 42-year-old woman the mother of five children. The breasts were large and pendulous, both had an irregular shotty feel. Pressure on the left breast yielded nothing, but pressure in any quadrant of the right breast caused the escape of a dark brown hemorrhagic material from the nipple. This was a case of chronic cystic mastitis. Deeply situated papillomata yield blood from the nipple only when pressure is applied over the tumor and not as above, in which pressure applied anywhere on the breast caused bleeding. The parenchyma of this gland on section was found to be riddled with cysts containing bloody serohemorrhagic and mucoid material.

An incision one half the circumference of and at the areolar border is made. The milk ducts are cut and the parenchyma of the breast removed by sharp dissection. The peripherally located fat is brought together by three superimposed purse-string sutures. The nipple areola skin-flap is sutured back into position with or without drainage. Complete illustrations accompany the article. K. L. VENT.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Elsen, P. The Roentgen Ray Treatment of Tuberculous Peritonitis. *Am. J. Roentgenol.* 974, iv 603.

Attention is called to eleven cases treated by deep roentgenotherapy. Although the roentgen treatment of tuberculous peritonitis was recommended soon after the therapeutic properties of these rays were recognized, it fell into disuse, as the results did not appear to be of any great value. With improved methods and the employment of rays

sufficiently strong to reach the peritoneal cavity the results of treatment will be better. The results that are often observed when the abdomen is opened, wiped with gauze and closed, even only for diagnostic purposes, are apt to be transient. If however, the point of infection, often the tubes in women and the appendix in men can be removed, the result is more likely to be permanent. These results must not be confused with those reported in this article. No bismuth or silver salts were used internally to create secondary radio activity but only the high radiation in conjunction with proper hygienic living,

plenty of fresh air and sunshine good food excluding only unripe fruits and raw vegetables. The parts that call for special treatment must be guided by the operative findings and two and one half years experience with this method of treatment strengthens the hope that the results obtained will be permanent. The treatment must be continued over a long period of time to obtain these results.

W S NEWCOMB

GASTRO-INTESTINAL TRACT

Stapelmoor S. von: Phlegmonous Gastritis (Zur Kenntnis der phlegmonösen Gastritis). *Nord med. Ark.*, Stockholm 1916 xlix *Kungl No 14* 1

Stapelmoor reviews the literature of phlegmonous gastritis and reports one personal and three collected previously unpublished cases. The condition is comparatively rare. In 1911 Jensen collected 131 cases from the literature 114 being diffuse and 16 circumscribed processes. Several other cases have since been reported.

The diagnosis is not often made *intra vitam*, the condition being more commonly discovered at autopsy.

The author's personal case was in a man of 38. The diagnosis from the symptoms was doubtful between phlegmonous gastritis and splenic abscess. The man was operated upon and died the following day. Autopsy demonstrated a phlegmonous gastritis with diffuse suppurative peritonitis ulcus ventriculi, etc. On the small curvature of the stomach 8 cm. from the pylorus there was a sharply defined ulceration about the size of a 2 pfennig piece. The ulcer was implanted in the mucosa with infiltration into the submucosa and muscularis.

The other two cases reviewed by the author were as follows:

The first case occurred in a man 42 years old who had had no previous history of stomach trouble and who died a few days after entering the hospital. The diagnosis in this case was acute peritonitis of unknown origin with double suppurative pleuritis. The patient was not operated upon.

Autopsy showed that the stomach wall was considerably thickened throughout particularly in the large curvature. About the pylorus the wall was 1 cm. thick. On the posterior wall of the small curvature nearer the cardia than the pylorus there was a 2 pfennig size peptic ulceration which perforated through the mucosa and infiltrated the submucosa. The anatomic diagnosis was streptococci phlegmonous gastritis diffuse peritonitis bilateral pleuritis, etc.

The second case was in a man of 65 who had suffered from gastric disturbance for several years. He entered the hospital with symptoms of acute peritonitis and died unoperated upon after 11 days. Autopsy showed the existence of a streptococcal ulceration deep in the mucosa, about 9 cm. from the pyloric sphincter. The whole stomach wall was thickened. The process had infiltrated into the submucosa.

In addition to the foregoing cases the author refers to a case of subchronic phlegmonous gastritis. Laparotomy was performed for a supposed tumor. The pathologic anatomic examination disclosed the true phlegmonous nature of the lesion. One and one-half years later the patient was in good condition with the exception of gastritis which still persisted.

W A BRENNAN

Westbrook, R. W.: Surgical Considerations of Acute Diffuse Phlegmonous Gastritis. *Long Island M J* 1916 x, 525

The author describes the condition of acute diffuse phlegmonous gastritis, reviews the literature and makes numerous observations on the surgical treatment. The report of a case forms the basis of the discussion.

This condition is fortunately rare as the mortality is practically 100 per cent. It was first mentioned by Varandaens in 1620 and to date about 100 cases are on record. There are two forms the circumscribed or abscess of the stomach walls, and the diffuse.

Pathologically the diffuse form is likened to a virulent erysipelas, the streptococcus being responsible. The stomach wall is much thickened especially at the pyloric portion the thickening being in the submucous coat. The mucous coat is intact although in the latter stages it is ulcerated. Likewise the muscular layer. The peritoneum is rarely perforated although local peritonitis is common.

The circumscribed form is due to the staphylococcus and forms a localized abscess in the submucous layer. This may rupture into the stomach or peritoneal cavity. Results of early operation should be good.

The diffuse form is more common in males and usually there is a history of alcoholic excess. However the etiology is as yet obscure although it is probable that the infection is hæmatogenous.

The onset of symptoms is abrupt and violent. Persistent vomiting is the chief feature, followed shortly by severe and continuous epigastric pain. Marked tenderness is present but with only mild rigidity unless peritonitis is present. The pulse early becomes weak and rapid and the temperature may run to 105 with chills. Thirst is extreme. Death occurs from septicæmia with general peritonitis.

The diagnosis must be made chiefly with regard to differentiation from acute pancreatitis and perforated gastric ulcer. A table of comparisons is given.

The case reported is that of a male, age 51 with negative previous history but a habitual whiskey drinker. Vomiting was the first symptom followed shortly by epigastric pain and hiccoughs continuing two days and accompanied by extreme thirst and chills. The temperature was 100.5 respirations 35 pulse 85. There was slight abdominal distention with epigastric tenderness but slight rigidity no jaundice leucocytes 40,000. The hand laid flat

on the epigastrium received a sensation of resistance or tumor. The diagnosis was acute pancreatitis or perforation of the posterior stomach wall.

At operation a segment of the stomach wall near the pylorus about 3 1/2 inches broad was found to be much thickened and boggy. The mesocolon and lesser omentum were very edematous. Upon incision of the stomach wall small beads of pus oozed out of the submucous layer. The condition being recognized gastrostomy for drainage was done the stomach being loosely attached to the abdominal wound. A tube was passed through the pylorus and two gauze drains placed in the lesser peritoneal sac with three large tampons around the stomach area.

Drainage was free and large amounts of saline given per rectum with general supportive measures. Epigastric pain continued however with a pulse of 120. The condition gradually grew worse and death occurred three and one half days after operation.

The autopsy report confirmed the diagnosis at operation.

After an analysis of the five operative cases reported Westbrook sums them up by saying that he can find no reliable proof of the cure of this condition by either medical or surgical means to the present date.

Among surgical possibilities Robson and Moynihan have suggested gastro-enterostomy or gastrostomy the former merely adds additional trauma to the stomach and gastrostomy has no noticeable effect as was shown by the author's case.

Westbrook believes that only free multiple incisions in the indurated area or partial gastrectomy offer any hope of cure preferably the latter. After excision of the area a drainage tube through the duodenum and either leaving the stomach end free but securely walled off by the packs or partial closure of this end with free drainage as the initial stage and later an anastomosis of the jejunum with the stump of the stomach or duodenostomy is advisable.

The conclusions are that

1. Acute diffuse phlegmonous gastritis is a rare form of inflammation of the wall of the stomach involving chiefly the submucous layer and produced usually by streptococcus invasion, locally or through the blood current. It is to be distinguished from local abscesses of the stomach wall, which is still more rare.

It occurs chiefly in middle and late middle life, but may occur at any period.

3. It is to be distinguished principally from acute pancreatitis and perforated gastric ulcer an important difference being the onset of vomiting before pain.

4. The prognosis is an absolutely fatal one unless surgery may ultimately produce a cure.

5. Simple gauze drainage about the stomach, gastrostomy and gastro-enterostomy as suggested by various surgeons, do not form adequate methods of surgical treatment.

6. Partial excision of the stomach in early cases with duodenal feeding and gastro-enterostomy at a later stage is a possible curative surgical procedure in early cases.

P. M. CHASE.

Eusterman, G. B. Gastric and Duodenal Ulcer. *N. Y. St. J. Med.* 917 xvii 33.

The following statistical review is submitted by the author.

During the period between June 1, 1915 and June 1, 1916 there were 75 cases of duodenal ulcer and 108 cases of gastric ulcer operatively demonstrated at the M. Y. Clinic or a total of 183 cases. These are exclusive of the cases clinically diagnosed and placed under medical management.

In the 75 cases of duodenal ulcer the clinical course and characteristic symptoms, or in other words the syndrome of duodenal ulcer was regular

5 or 82 per cent. The gastric ulcer type of syndrome was present in 8 per cent. The total number of cases with an ulcer syndrome amounted to 100 per cent. In the remaining 10 per cent the clinical features were atypical so that in the absence of laboratory data or more extensive observation, no diagnostic conclusion could have been reached. Hyperacid gastric contents were noted in 80 per cent, gross pyloric obstruction in 10 per cent, and hemorrhage single or repeated in 25 per cent.

A primary clinical diagnosis of duodenal ulcer was made in 84 per cent, gastric ulcer in 4 per cent, a total of 88 per cent. An erroneous diagnosis of gall-bladder disease was made in 9.4 per cent. These percentages agree up well with the results of form 7 statistics. Appendicitis was the sole diagnosis in 3.6 per cent of the cases.

Definite roentgen diagnosis of duodenal ulcer was made in 67 per cent and the roentgen examination rendered assistance in a further small percentage. In a total of 93 per cent the diagnosis of ulcer primary alternative was recorded. Of 275 patients,

42 or 83 per cent were submitted to the test meal and roentgen examination. Of 108 patients with chronic benign gastric ulcer, sixty, or 56 per cent, had the clinical characteristics of the purely gastric type, 37 per cent of the case histories, while indicating ulcer quite clearly did not designate whether it was gastric or duodenal. In the remainder the clinical history was so irregular or insufficient as to be of no contributory diagnostic value. Gross obstruction was noted in 14 per cent, hyperacidity of the gastric contents in 72 per cent, anacidity in 2.8 per cent, hemorrhage in 25 per cent, i.e., hematemesis in 0 per cent, both hematemesis and melena in 2 per cent, and melena alone in 2.8 per cent.

In 86 or 80 per cent of the 108 cases a primary diagnosis of gastric ulcer was made. Thus there was a primary diagnosis of ulcer in a total of 104 of 108 cases, 96 per cent. This unusual showing and localization of the lesion was made possible through close routine correlation of clinical and roentgen data. Cardinal signs of ulcer were demonstrable in seventy cases, 65 per cent. In another 13 per

cent the roentgen findings of a lesion in correlation with clinical data justified the diagnosis of ulcer. Thus in a total of 78 per cent of the cases there was direct roentgenologic data, and in this particular series these findings were of primary importance in the diagnosis and localization. Of interest was the presence of a six hour barium residue in varying amount in 40. per cent of the cases, in contrast to 13.4 per cent in the duodenal series. J. H. SKILES

Témoins: One Hundred and Eighty-Six Operations for Chronic Stomach Ulcer; Utility of Large Resections (186 opérations d'ulcère chronique de l'estomac; de l'utilité des larges résections) *Bull Acad de méd* Par 1917 Lxxvii, 75

Témoins statistics of gastric ulcer include all his operations from 1898 to the present time. From 1898 to 1914 he operated upon 69 cases during the last three years 117 cases the increase being to a large extent due to war conditions.

In his earlier cases he confined himself largely to gastro-enterostomy. While in all cases there was amelioration yet in many cases there were recurrences of the symptoms. Owing to the fact that the pyloric region remained painful in spite of the anastomosis in later cases he resected the pylorus with more satisfactory results. However in all cases the result was not absolute and this he attributes to the fact that the pyloric resection was too conservative.

Discussing the situation of gastric ulcer the author refers to the Congress of 1910 where it was shown by Anglo-American surgeons that duodenal ulcer was much more frequent than gastric, in fact twice as frequent. French surgeons did not recognize this frequency but the author thinks that it is only a question of terms. Foreign surgeons limiting the pyloric region to the pyloric vein, the portion to the right being duodenal, to the left pyloric. Such a distinction if it has the advantage of being anatomic is less just from the clinical and surgical standpoints because an ulcer situated say 2 cm. to the right of the pyloric vein has a very strong effect on the pylorus and on the pyloric end of the stomach. Témoins thinks it is preferable to reserve the name of duodenal ulcer for those situated entirely in the second or third part of the duodenum or which have no connection with the pylorus.

Témoins refers to the inflammatory lesions found in the serous and muscular coats or in the cellular tissue in the vicinity of an ulcer. These he thinks play as important a rôle as the ulcer itself and they explain why operations which are too conservative often yield such poor results.

For a truly curative and surgical procedure Témoins thinks it does not suffice to anastomose to bury the ulcer or even to resect quite close to the pylorus, all the inflamed area must be suppressed the entire pyloric antrum resected and especially the organ must be freed from adhesions. When the operation is complete what is left of the stomach must be mobile and completely free because suppression of pain depends on this. Besides removing

all the inflamed area, large resections also prevent postoperative perigastritis. Since the author has adopted this procedure his results have been admirable the patients digest perfectly without pain and they gain weight rapidly.

The operation is without danger and is easily executed. The technique is described in detail. The abdominal cavity being opened, the stomach is carefully examined and the site of the ulcer and inflamed zone localized. The duodenum is clamped beneath the diseased part if it is a duodenal ulcer the clamp being placed beneath the pylorus if it is a gastric ulcer. The intestine is severed the upper end held by a forceps inserted in a compress is rabatted upon the left side followed immediately by purse-string suture of the intestinal lumen which is covered by a second row above the neighboring cellular tissue in order to bury it well. The author then makes what he terms a vascular decortication of the vessels which ramify the gastric surface followed by the amount of gastric resection which the extent of the lesions demand and the stomach is closed by a double or treble row of sutures. The operation is terminated by a posterior or transmesocolic anastomosis. Twenty minutes suffices for the whole procedure. Adhesions may give trouble but they can always be dissected out.

In the author's last 117 cases he has only lost 3 patients and in this series the first 84 cases recovered 64 were men 53 were women. The youngest patient operated upon was 40 years old and the oldest 67. In 9 cases the ulcer was clearly duodenal and in about 60 cases the ulcer was situated near the pylorus to the right of the pyloric vein. There were 11 multiple ulcerations. There was perigastritis in 44 cases 33 had a biocular stomach 21 had almost complete atresia of the pylorus. The patients were mostly cachectic and thin but since the operation they have greatly increased in weight.

The author concludes that for pyloric ulcer resection is the operation of choice provided it is extensive enough to include all the inflammatory area in the vicinity that it is indispensable to free the organ from all adhesions that vascular decortication is a useful modification of the operative technique and that the use of his own two forceps specially designed facilitates the operation.

W. A. BRENNAN

White, F. W. Some Limitations in Roentgen Ray Evidence of Gastro-Intestinal Lesions. *Boston M & S J* 1917 Lxxvii, 92

As most remarkable claims have been made by some roentgenologists as to the exactness of their interpretations for various lesions within the abdominal cavity, and from their deductions often serious results have followed. White emphasizes that all roentgenologic examinations should be supported by other clinical examinations. The enthusiasm of the roentgenologist is too apt to influence a critical review therefore all clinicians should be trained in the examination of plates as

well as in the interpretation of the screen findings. Different kinds of roentgen findings are of entirely different value. The findings of old cancer and calcified stones differ from early cancer. Intestinal adhesions and cholesterol stones in the latter the roentgen evidence is usually doubtful and far from positive and it is exactly in these cases where the clinical evidence is often hazy the error the confusion is not apt to be lessened. In the oesophagus spasm may be missed mistaken for cancer while on the other hand early cancer may be overlooked until it has reached the stage of deformity. If one considers the statistics of 100 per cent correct diagnosis as inconsistent with other facts concerning the irregularity of all gastric and intestinal functions and where a correct interpretation is most needed as in early cancer it again fails. In duodenal ulcer the value of the roentgen ray seems to be of the most service and is less apt to fail although it must be remembered that in certain conditions as in adhesions, and gall-bladder disease the defects the cap will simulate ulcer further more a fresh bleeding ulcer will often fail to show at all. In gall stones he finds the statistics worthless if it is only those that show a positive picture that can be considered, while those where the shadow is not observed cannot be considered of positive evidence. In regard to the region of the appendix he finds that only in half of the cases that have come under observation has the correct diagnosis been made from a roentgenologic standpoint therefore all conditions found in this region should have strong clinical findings to support them. As there are no laboratory findings and no characteristic histories of intestinal adhesions the roentgen ray is the best method of diagnosis, and here the fluoroscope must be used for the examination of plates alone, as the adhesions are very likely to be overlooked. In considering stasis it must not be forgotten that the time taken for the stomach to empty is a most important factor. W. S. N. CORRY

Wilms: The Method of Action of Roentgentherapy in Spasm of the Pylorus. *Archives and Wechsler* 9 6 No. 30.

Having observed the disappearance of spastic irritative conditions in prostatic hypertrophy when submitted to roentgen treatment Wilms tried irradiations also in other forms of spasm, pyloric spasm seemed to lend itself well to this method.

From his clinical experience Wilms thinks that in pyloric spasm as in irritable prostatic cases the favorable action of the X-rays is found on their well known influence in suppressing inflammatory conditions. Some cases of pyloric spasm are dependent on alterations and lesions of the walls of the stomach which provoke cramps by irritation of the nerves.

Such pyloric spasm is an irritative inflammatory condition which is similar to the inflammatory alterations in prostatic hypertrophy.

While Wilms is unable to say that any favorable

influence can be obtained in the case of spasm traceable to ulcer he thinks it possible because here also the inflammatory irritative state which is created about the ulcer can be benefited by the irradiation.

W. A. BREDENAK.

Stann, H. G. Pyloric Stenosis in Infancy. *Cleveland M. J.* 19 6 xv 76.

The author emphasizes the clinical course, methods of diagnosis and of treatment in cases of infantile pyloric stenosis. An interesting account of the first reported case in 1788 prefaces the discussion.

In congenital stenosis the babe is usually normal in weight at birth, the symptoms starting with sudden vomiting at the end of the feeding or soon after. Thus vomiting is forcible in type the feeding often being expelled five or six feet from the body. There is no apparent nausea, for the infant is eager at once for more nourishment. If the abdomen is inspected shortly after feeding, marked rhythmic peristaltic waves may be discerned traversing the stomach from left to right. In some cases it is possible to palpate a little tumor at the pylorus, especially if the babe is in a warm bath to relax the abdominal muscles. When the obstruction is not complete, the stools are small, but of fecal consistency. If practically no food is passing through the pylorus there is a typical starvation stool, and a lessened amount of urine amounting to anuria. The weight loss is inversely proportionate to the amount of food passing the pylorus. The child is shrunk in appearance. On an average, it takes about three months for the babe to starve to death.

If during the first three months of life an infant has projectile vomiting at the close of feeding or shortly after if it has the characteristic peristaltic waves from left to right and if more or less meconium is present in the stools a diagnosis of pyloric stenosis is practically certain. The degree of the obstruction may be determined by feeding the infant a measured quantity of food and aspirating the stomach three hours later to determine the amount that has passed the pylorus. An x-ray observation after bismuth meal as well as after the use of the duodenal tube will also throw light on the subject.

If the diagnosis is made early and if the obstruction is only partial, medical treatment is often effective, but it entails a long supervision extending over a year or longer. If operation is not too long delayed there is little danger to the patient. The previous high mortality is due to the delay in surgical intervention and to the type of operative procedure, which heretofore has been gastro-enterostomy. With the greatly simplified Ramstedt operation, anesthesia is necessary for a much shorter time, less manipulation is required, and there is greater post-operative ability on the part of the babe to take food and to retain it.

Before operation the infant is given each hour an enema of 3 cc. of sodium bicarbonate 5 per cent and cane sugar 5 per cent. The soda is to decrease acidosis, while the levulose of the sugar

is readily oxidized. An hour before operation three drops of tincture of opium are added to the enema, thus making necessary a minimum amount of anesthesia. The baby is wrapped in cotton batting and laid in a blanket over hot water bottles in order to maintain normal body heat. After anesthesia is complete 100 to 200 ccm. of salt solution are inserted under each breast in order to dilute the acid metabolic by products as much as possible the fluid carrying the waste acid components off through the kidneys. Skin muscles and fascia are blocked with novocaine and the tumor is delivered into the incision. When the stomach is exposed a catheter passed from the mouth to the stomach evacuates the gas it contains. The tumor is held between the thumb and index finger, while a sharp knife makes a longitudinal incision through the tumor down to the mucosa. Blood loss is carefully avoided. No attempt is made to suture the incision which gapes open widely and allows the mucous membrane to bulge into the opening sufficiently to relieve the obstruction. The silkworm gut sutures which close the abdominal incision are reinforced by transverse strips of adhesive, shaped like a butterfly the middle of the strips being cut on either side so as to narrow the adhesive just where it crosses the wound.

For three hours after operation the baby is kept head down at an angle of 45 degrees. The head is then raised gradually until the body assumes a sitting position. Feeding is started as soon as the babe regains consciousness 15 ccm. being given every two hours and an equal amount of water between feedings. Daily cleansing enemas are given, for keeping the lower bowel free, the babies seem better able to take and to retain their feedings. For the first two days, the soda and sugar enemas are given three or four times in twenty four hours.

After the Rammstedt operation, there is less vomiting than after gastro-enterostomy. If a baby cries for 15 minutes or more 30 drops of paregoric will keep it quiet during the healing of the wound. So far the literature contains no account of the recurrence of the symptoms following the Rammstedt operation.

Cole, L. G.: Roentgen Indications for Surgical Procedure in Postpyloric Ulcer. *Intern. M. J.* 1917 xiv No. 1

Cole states that by his method of roentgen examination, i.e. serial roentgenography he is able to determine the indications for surgical procedure in postpyloric ulcer. He takes exception to Moynihan's statement that the treatment of chronic duodenal ulcer should always be surgical and in a study of a hundred cases of postpyloric ulcer selected from a thousand gastro-intestinal examinations he shows a definite grouping of the cases as to the indications for medical treatment or surgical intervention. His conclusions are as follows:

1. Serial roentgenography reveals the extent of the progression or retrogression of pathology in

postpyloric ulcer and this method of examination used in connection with the clinical progress of the patient gives a definite indication in the choice between medical and surgical treatment.

2. Postpyloric ulcer evidenced by an obliterated cap and pyloric or postpyloric stenosis and broken gastric compensation, demands surgical intervention. Eight of the hundred cases fall in this group.

3. Postpyloric ulcer evidenced by an obliterated or deformed cap with stenosis and failing gastric compensation, requires surgical intervention. Eight of the hundred cases fall in this group.

4. Postpyloric ulcer evidenced by deformed or obliterated cap without stenosis but with a deep crater and thick edges requires surgical intervention. Four of the hundred cases were in this group.

5. Postpyloric ulcer evidenced by an obliterated or deformed cap and secondary gastric involvement, requires surgical intervention for the removal of the induration. Five of the cases were in this group.

6. Postpyloric ulcer evidenced by obliterated or deformed cap and with compensating peristalsis, forms a borderline group where the choice of procedure must be determined by the clinical progress and subsequent roentgen examination. Twelve of the cases were in this group.

7. Postpyloric ulcer evidenced by simple cap deformity and with or without slight stenosis and with a normal or compensating peristalsis and without deep crater or secondary involvement, is more completely relieved of symptoms by medical treatment than by surgical intervention. There were sixty three cases in this group.

Mann, F. C.: The Effect on the Jejunal Mucosa of Exposure to the Gastric Juice. *J. Med. Research*, 1917 xxiv 289.

The investigation was made for the purpose of observing the continued effect of gastric juice on an isolated portion of the jejunal mucosa. It was thought that by concentrating the effect it would be possible to determine the part played by the gastric juice in the production of gastrojejunal ulcers.

The operative procedure consisted in functionally resecting a loop of the first part of the jejunum, varying in length from six to twelve centimeters, and implanting it with intact blood supply into the posterior wall of the stomach in the region of the antrum of the pylorus. The continuity of the intestine was maintained by anastomosis. In some of the experiments silk or linen sutures only were used in others catgut was used for the through-and-through sutures. All the operations were done under ether anesthesia. In this manner the portion of the jejunum, which is usually next to the stomach in a gastrojejunostomy, was placed in the part of the stomach which is almost always bathed with free acid. Furthermore, the condition of the transposed jejunal mucosa differed from that of the mucosa near the stomach of a gastrojejunostomy in that the former was not protected by the other in

testinal secretions. Because of this the effect of the acid should have been many times greater on the transposed jejunum.

Dogs operated on in this manner recovered from the operation and maintained excellent health for many months. At various periods thereafter the animals were killed, and after the gross specimens were studied, sections of the transposed jejunum, and of the jejunum near the origin of the former were fixed in various solutions for microscopic examination.

The results of the investigation were reported as based on 14 experiments. The specimens were obtained after operation as follows: days 6, days 3, days 22, days 5, days 83, days 90, days 117, days 146, days 173, days 28, days 39, days, and 330 days.

When the dogs were killed within a week after operation the specimens grossly presented swelling and edema at the suture line, which are noted in all recent operations on the gastro-intestinal tract. Away from the suture line the jejunum did not show any changes. The specimens obtained after complete healing had occurred showed a few gross changes. These increased progressively to a maximum a few months after operation and consisted of (1) a slight increase in the thickness of both mucosa and muscularis, (2) a throwing of the mucosa into folds which corresponded roughly to the rugae, and (3) a change in the color of the mucosa, which became much lighter and was covered with a thick mucoïd substance.

While the increase in the thickness was definite, it was not very marked or constant. The earliest specimens obtained after operation in which an increase in thickness was noted was fifty-one days. In four specimens showing the most marked increase in thickness, measurements of the transposed tissue and normal jejunum were compared. The average total increase in thickness of the transposed jejunum was 0.65 millimeter; the muscularis had increased an average of 0.35 millimeter and the mucosa, 3 millimeter.

The microscopic picture varied considerably in the different specimens. This variation was not due wholly to difference in time after operation, because specimens obtained at approximately the same time after transplantation did not present a uniform appearance. In a few experiments there was an increase in the mucus-producing cells. In some cases these were increased not only in number but also in size. Some tubules seemed to be composed almost wholly of goblet cells. In a few of the specimens there was very active cell proliferation. This appeared to be an exaggeration of the normal cell division occurring in the base of the glands. In some instances there was a decrease and in a few areas almost total absence of gland cells. In these specimens there might also be an infiltration of the subepithelial tissue. The latter changes may have been due to the changes of environment or to a decrease in the blood supply. In general, the

changes were slight and in many cases it was impossible to distinguish between sections of the transposed jejunum and sections from the jejunum at its site of origin.

Briefly summarized Maun concludes as follows. When an isolated portion of the jejunum is transposed into the wall of the stomach the following changes may be noted. There may be slight thickening of both mucosa and muscularis. The mucus-producing cells may be increased in both number and size. There may be an active cell proliferation. In several of the experiments no change in the transposed mucosa was noticed. Ulceration of the mucosa occurred in one experiment, and in this case a non-absorbable suture was found in the base of the ulcer. The gastric juice is probably not the primary cause of gastrojejunal ulcer, he believes. The function of the transplant as tested by its power to absorb fat was practically normal.

GEORGE E. BERNET.

Drummond: *If: Sacculi of the Large Intestine, with Special Reference to Their Relations to the Blood Vessels of the Bowel Wall.* *Br. J. Surg.* 9: 1-407.

The author seeks to throw some light on the question of the etiology of sacculi of the large bowel, based on a study of 30 postmortem specimens.

These sacculi are always acquired; are found in any part of the large intestine; are found in elderly people; are always multiple; and vary in size from a hemp seed to a hazelnut.

Several authorities (Klebs, Hansenssen, Beer) are quoted with various views as to the etiology.

In none of the author's specimens was there any sign of heart-disease and chronic venous congestion, although it is common to find the colon densely adherent and the mesentery shortened. Chronic constipation, believed by many to be of importance, is not so considered by Drummond, who regards an inherent weakness of the non-striated muscular tissue chiefly in the lower bowel as the main factor. These sacculi never appear in the mesenteric border of the bowel where runs the thick mesocolic band but in those situations where the coats of the intestine are weakened by the entrance of the blood vessels. After forming in this spot, i.e., between the mesocolic and one of the lateral bands, the sacculi follow the line of least resistance, extend along the course of the vessels and frequently come to lie close to the edge of the mesentery.

Drummond's conclusions are as follows:

Sacculi of the large intestine are multiple; occur only in old people; and are acquired.

a. They are probably due to a general deficiency of the non-striated muscle tissue of the individual, as is shown by their tendency to occur in various viscera of the same individual. Chronic venous congestion and intestinal obstruction are not of prime importance in their etiology.

3. Sacculi may occur in any portion of the colon, but the pelvic colon is by far the most common site.

4. Sacculi make their appearance almost invariably at one point in the colon wall, viz. between the mesenteric and lateral longitudinal muscular bands. After piercing the muscle coat they follow the sheaths of the vessels toward the mesentery. They never open primarily into the leaves of the mesentery as do the sacculi of the small intestine.

5. The blood vessels of the normal colon may be said to predispose to sacculi to the same extent as the spermatic cord does to an inguinal hernia.

P. M. CHASE.

Telling W. H. M., and Gruner O. C.: Acquired Diverticula Diverticulitis, and Peridiverticulitis of the Large Intestine. *Brit J Surg* 1917 iv 468.

The subject has been very thoroughly studied and excellently covered in the article which is based on a review of 324 cases.

Diverticulitis has been recognized for more than a century but it was first given prominence by Graser in 1898 when he described the hyperplastic stenosing type and discussed its similarity to carcinoma of the sigmoid flexure. Later Moynihan laid special stress on vesicosigmoid fistula caused by diverticula.

Diverticula of the intestine are congenital or acquired. The latter may be true or false. In the lower bowel retention of feces of varying consistency causes the secondary pathology and clinical importance of diverticula. They are found most frequently in the distal portion of the sigmoid flexure. The whole colon may be studded as many as 400 having been reported. In the small intestine the mesenteric attachment is the most frequent site of occurrence, while in the colon this portion is seldom involved.

Diverticula are generally multiple and are frequently found as hernial protrusions of the mucosa into the appendices epiploicæ possibly because of lowered resistance. Lipping at the orifice is frequently shown.

Nothing definite is known of the etiology. Increased pressure within the bowel (pulsion diverticula) due to accumulated feces or gas, weakened intestinal musculature especially in the obese (60 per cent) cachexia and emaciation, and congenital predisposition may be causes of diverticula. However the occurrence of most cases at an advanced age is an argument against the congenital view. The age ranged from 6 to 90 years most of the clinical cases occurring between the ages of 40 and 65. A diagram is given to show the relative frequency at different ages. There is a predominance in the male sex. Most patients are in a good state of nutrition or obese. Blood-vessel entrance and exit or appendices epiploicæ attachments may mark sites of lowered resistance.

Diverticula tend to enlarge but usually no great size is attained. The hardening of contained feces leads to mechanical irritation inflammatory changes and perforation. The presence of micro-organisms hastens these changes. Peridiverticulitis may result, possibly causing perisigmoiditis and scirrhusoid

stenosis of the sigmoid. In diverticulitis there is an absence of ulceration of the mucous membranes as noted in true carcinoma, but diverticulitis may be associated with the development of carcinoma.

The histology and bacteriology is discussed and a number of illustrative plates are given. Secondary pathological processes are classified as (1) mechanical from (a) fecal concretions (b) torsion and (c) lodgment of foreign bodies in the diverticulum (2) inflammatory resulting in diverticulitis per diverticulitis, and perforation with the varied secondary pathology. Metastatic suppuration and the development of carcinoma may take place. These various processes are considered more in detail. Each may be present but one predominates as a rule.

Clinically inflammatory trouble more or less acute located in the left lower quadrant of the abdomen constitutes by far the largest group of cases with intestinal obstruction and peritonitis, carcinoma of the intestine may be simulated and vesicocolic fistula may result.

Pain is a very frequent and vomiting an infrequent symptom of inflammatory lesions. Tenderness and muscular rigidity are extremely frequent symptoms.

Tumor was noted in 30 per cent of the cases and is usually elongated. It may disappear and recur, which fact may aid in diagnosis. Abscess occurred in 28.8 per cent and frequently formed a palpable tumor. Bladder and pelvic symptoms may result from extension of the processes.

Constipation is more frequent than diarrhoea, and the absence of visible blood in the stool is a notable feature. Acute general peritonitis occurred in 18 per cent of the collected cases and usually followed diverticular perforation.

Vesicocolic fistula of diverticular origin should be suspected with evidence of a long-standing inflammatory or bowel trouble in the left lower quadrant of the abdomen. If the history is primarily vesicular another origin is probable. These fistula may undergo spontaneous recovery.

Pelvic syndromes usually due to adhesions, were noted in 7 per cent of the cases. Intestinal obstruction may be acute.

In the diagnosis the sigmoidoscope is of value only in ruling out carcinoma. Bismuth meal or enema followed by roentgenogram may show stenosis of the sigmoid flexure but rarely shows diverticula.

The absence of the shadows of malignancy from the general picture (Giffin) or X-ray demonstration of diverticula, tendency to obesity history of recurrent tumor absence of blood in stools for a prolonged period, vesical fistula in which bladder malignancy can be excluded by cystoscopy and negative sigmoidoscopy as regards malignant disease, are the chief points aiding in the differential diagnosis from carcinoma.

In carcinoma of the sigmoid loss of flesh is noted early pain and tenderness are late and are often preceded by tumor. Some unusual complications

are pulmonary embollism, left-sided phlebitis, pyelophlebitis, fat necrosis, severe rigors, and suppuration in a hernial sac. The treatment is surgical.

— (A. R. STEEKE.)

Fowler W. F. Enteroplasty for the Relief of Sig-
moid Obstruction. *Surg. Gynec. & Obst.* 97
xvi 13.

Fowler reports a case of benign stricture of the sigmoid in a man 60 years of age. Constipation became almost absolute, causing marked distention. A median incision was made and the sigmoid brought out of the incision. In doing so a small rupture occurred at the site of constriction. The rupture was enlarged by two incisions in the long axis of the bowel, one extending upward and one downward, the length of each corresponding approximately to the normal diameter of the sigmoid. The longitudinal slit was transformed, in effect, into a transverse union by bringing together corresponding points of the upper and lower incisions with a through-and-through linen suture and reinforcing seroserous suture also of linen. The lumen was therefore restored in the plane of the mesenteric and free borders, rather than from side to side.

— (A. R. STEEKE.)

LIVER, PANCREAS AND SPLEEN

Peck, J. L. Surgery of the Gall Bladder and Bile-Ducts. *II* *Harman, Month* 96 h, 80.

The author reviews briefly the history of gall bladder surgery, and outlines the following indications for surgical interference: (1) to relieve mechanical obstruction in the course of the bile stream and the conditions associated with it—gall stones, new growths, cicatricial contractions; (2) to provide escape for bile containing bacteria and toxins in all infected cases.

Gall-bladder surgery has fluctuated from one extreme to another. Many experienced surgeons have practiced almost exclusively cholecystectomy and drainage of the gall-bladder and the bile-ducts, while many surgeons, at the present time excise the gall bladder with drainage of the common and hepatic ducts, in almost every instance. Surgeons who adhere routinely to either of these methods are often in grave error. In cases of an inflammatory infective process, where there is pericystitis, where the gall-bladder is adherent to the abdominal wall and the surrounding structures with superficial tenderness, drainage of the gall-bladder is all that these require at first. If no cure results a radical operation can be performed subsequently with far greater safety.

The author divides these cases into two classifications, each requiring different surgical treatment: (1) an acute infective, and inflammatory process; (2) those conditions in which mechanical obstructions are in evidence, such as gall-stones without clinical signs of inflammation. It is safe to operate between attacks than during the attack. It is better for the surgeon to perform two judicious

operations resulting in recovery than to adhere to a certain well-performed classical operation, resulting fatally.

Often if the gall bladder is subjected to drainage, ultimate cure does not result. In this type, cholecystectomy is necessary to secure a permanent and complete recovery. If prolonged drainage of the cholelithus duct is necessary after removal of the gall bladder, a tube is sutured into the cystic and common ducts. In case of acute cholecystitis with pus, the gall bladder being separated from the general peritoneal cavity by omental adhesions, it is not advisable to remove the gall-bladder. It is drained, disregarding the stones.

Cholecystectomy is indicated in all cases where calculi have remained in the cystic duct for some time.

It is generally agreed that the appendix should be inspected and removed when necessary, when the abdomen is opened for pelvic surgery. This does not hold when conditions are such as to contraindicate further operative manipulations and the same rule holds in case of gall stones.

In order to secure the best operative results, gall stones should be removed as early as possible before complications have set in. Gall-stones are much more common in women than in men, and in women who have borne children. In the Mayo Clinic 90 per cent of the patients have borne children, and 90 per cent of these women dated the beginning of their symptoms to some pregnancy. Gall stones are much more prevalent in the middle and later decades of life. Gall-bladder surgery performed coincidentally with pelvic surgery rarely prolongs the convalescent period.

About ten per cent have recurrent symptoms, 30 per cent of gall-stones not removed in the course of pelvic operation, show subsequent attacks of gall-stones. Failures are usually due to failure to remove all the stones or to short drainage. Re-formation of calculi after operation is rare. Stones are sometimes found on unabsorbable suture material.

The conclusion is that if no foreign material is used in operation upon the gall bladder and ducts, re-formation of calculi is almost always a negligible factor. The two most important factors in end results of gall-bladder surgery are the removal of all stones and the maintaining of drainage for a sufficient length of time. In the absence of organic duct stricture, the question of cholecystectomy against cholecystectomy is one of expediency.

In many diseased gall-bladders, it is wiser to remove the gall-bladder than to attempt to remove all stones and fragments of stones, the same is true where a great number of small stones are present. In large, chronic cystic gall-bladders, stricture of the cystic duct is usually present, and removal of the organ is called for. When the gall-bladder contracts and its walls are thickened and diseased, the so-called nubbins of a gall-bladder should be excised.

E. C. ROBERTS

Baird B. D. Intraparenchymatous Haemorrhage of the Spleen. *Ann Surg Phila.* 1916 Lxiv 537

The author reviews the literature of this rare condition and adds one case making a total of six cases reported.

Intrasplenic hemorrhage is but barely alluded to in standard works and is frequently confounded with the two well known forms, viz that due to external rupture and the so-called blood cysts. It has been referred to as intrasplenic hematoma, hemorrhagic splenitis, apoplexy of the spleen, etc. Generally speaking however it is a hemorrhage entirely in the substance of the spleen involving the entire organ or one or both poles. The extravasation is large and as a rule of the gravesent type.

The case is reported of a male, 36 years old, with negative family and personal history who had been seized 17 days previous with sudden dull pain in the pit of the stomach. The pain gradually increased in severity and settled under the left edge of the ribs. He was troubled by nausea and vomiting but there was no hematemesis.

Examination showed some anemia pulse 86 temperature normal and respirations 30. The chest showed dullness and decreased fremitus below the fifth rib on the left side the right side was negative and the heart normal. The left hypochondrium was distended and very tender otherwise the abdomen was negative.

The urine showed one half of 1 per cent albumin with some granular casts.

Blood examination showed 40 per cent hemoglobin 3,176,000 red and 130,000 white cells with many normoblasts present.

Operation revealed a large, tense, adherent spleen which was removed, weighing 3,344 grams. The patient improved for three days but died on the fifth from general exhaustion.

The pathological finding was simple splenitis. In analyzing the six undoubted cases it is notable that there was no history of trauma or infection in any. Pain was present in 3 of the 6 and a history of prolonged splenomegaly in only 2. There was no symptomatology of note in any of the cases.

The conclusion is that extensive intrasplenic extravasations are very rare and not associated with any one special morbid process, although a certain amount of splenitis is usually present.

P. M. CHASE.

Krumbhaar E. B.: The Value of Splenectomy in Diseases of the Blood. *Penn. M. J.*, 1916 xi, 170.

The different phases and various interesting points of splenectomy in certain blood disorders are noted by Krumbhaar with a brief résumé of the literature.

Regarding contra indications for splenectomy leukemia polycythemia, malaria atrophic cirrhosis of the liver tuberculosis, and syphilis are the most prominent and in no instance should it be considered without a thorough study of the blood. Cases of hemorrhagic diathesis unless caused by Banti's disease are ruled out. Likewise, must the case pre-

sent signs of bone-marrow activity (nucleated cells Jolly bodies, etc.)

The chief indications are Banti's disease Gaucher's disease, both forms of hemolytic jaundice and to a certain extent pernicious anemia.

In Banti's disease operation must be done in the first stage for safety and the best results. In 1912 Isaac collected 40 cases with a mortality of 16.3 per cent, and today it is even lower.

In Gaucher's disease it is the wisest plan to operate only upon such cases as are unusually handicapped by the disease and yet are good surgical risks, as the prognosis is at best only improvement and the mortality is high.

Splenectomy has brought the best results in hemolytic jaundice of both types, congenital and acquired. In 1915 Elliott and Kanavel collected 48 cases of these only 2 died and the remaining 46 are reported as cured. However the fragility of the red cells rarely returned to normal although the jaundice disappeared the anemia decreased, and the urobilin excretion practically ceased.

It is too early as yet to base any opinions on the benefit of splenectomy in pernicious anemia, as 1913 marks the first attempts by Eppinger and von Decastello. The author has collected 153 cases 30 of which died shortly after operation. In nearly all of the remainder immediate improvement resulted there was a steady rise in hemoglobin and red blood-cell count with a corresponding improvement in strength and weight. In quite a number of cases after steady improvement for about eight months or a year relapses occurred and the old blood condition returned. Of 27 cases heard from one year after operation 13 were improved or improving 7 relapsed and 7 showed no sign of anemia. Where spinal cord changes occur operation brings no change.

In the differential diagnosis Banti's disease will show in the early stage gradual increasing pallor and weakness with abdominal pain and digestive disturbances accompanied by an enlarged hard spleen. Anemia of the chlorotic type is present leukopenia appears. The second stage is characterized by scanty urine diarrhea dyspepsia, and enlargement of the liver the third stage by cirrhosis, recurrent ascites, and jaundice.

In Gaucher's disease the symptoms appear in childhood and are familial a large abdomen, enlarged spleen brownish color of skin and blood changes similar to those of Banti's disease.

The chief changes in hemolytic jaundice are persistent acholic jaundice enlarged spleen, and decreased resistance of red blood-cells to hypotonic salt solution.

On general principles splenectomy should be done as soon as a definite diagnosis is made. Exceptions to this are a crisis of deglobulization in hemolytic jaundice or a hemorrhage from a mucous membrane in Banti's disease. Likewise, the findings of a positive Wassermann or malarial organisms would postpone the operation until these had been reduced as

far as possible. When the anemia is severe a series of blood-transfusions are indicated before operation. Oftentimes a subcutaneous or intra-peritoneal injection of spleen extract will stimulate the bone marrow in pernicious anemia.

P. M. CHASE.

MISCELLANEOUS

Jackson, H. Abdominal Pain. *Boston M & S J* 97 April

The paper is based on cases seen in the Boston City Hospital with some drawn from private practice. The causes of acute abdominal pain may be broadly divided into the following classes:

1. Spasm of internal organs of which gall-stone colic may be spoken as the type.

2. Pain of nervous origin, the type of which is to be found in the crises gastriques of tabes; this is perhaps the most dangerous classification, as usually the diagnosis is wrong and on the other hand good many diagnoses of ulcer of the stomach have been made when the pain and vomiting were only localized manifestations of spinal cord diseases.

3. Pathologic lesions of various internal organs, for instance ulcers of various internal organs as stomach, duodenum etc. Under this head may be classified the pain due to volvulus, twist of the intestines and torsion of their organs.

4. Referred pain, in the author's opinion represents the most dangerous type of abdominal pain. Such diagnosis is permissible and justifiable yet in each individual case the burden of proof lies upon the physician and often requires the skill of good surgeon to confirm the diagnosis of the physician. The most common cause in the author's experience has been the very acute abdominal pain which may be associated with the onset of pneumonia.

5. The last but of course the most common, and certainly the most important type because amenable to immediate and successful treatment, is inflammation of the various internal organs, which eventually leads to peritonitis local or general with prompt recovery or tragic death according to the knowledge and skill of the attending physician.

Into one of these five classes most and perhaps all cases of abdominal pain may be placed.

In view of the recent widespread theory that operations for acute abdominal conditions are too frequent, it seems to be comforting that statistics can show that operations are rarely performed without adequate cause and it is to be regretted that at times the importance of spasm has been overlooked, and diagnosis of colic or nervous pain made in a patient who really had appendicitis or pus tubes. This has been the author's experience in a large general hospital where the surgeons and physicians are in constant consultation and, what is perhaps more important, are always under the criticism of bright young house officers.

To reiterate, pain, tenderness, spasm and fever never mean indigestion.

In Class 3 the author calls attention to acute nephritis as a cause of abdominal pain, and quotes two cases, one diagnosed as "grippe." Attention is also called to purpura hemorrhagica as a disease not rarely causing abdominal pain.

In Class 4 of referred pain, the author especially emphasizes the pain associated with lobar pneumonia and heart disease.

In speaking of operations for acute appendicitis, Jackson says:

I have been sorry that I have not urged operations but have so far not regretted that operation had been done for a supposed or probable appendix. Of course the older men have seen many a case of acute appendix recover promptly under medical treatment but I know no safe rule to decide that one should wait.

Desplas, B. Right Abdomino-Gluteal Perforation by Bullet; Visceral Lesions; Laparotomy; Complicated Lesions of the Os Iliac and Hip Articulation (Perforation abdomino-fessière droite par balle lésions intestinales de l'abdomen laparotomie lésions compliquées de l'os iliaque et de l'articulation de la hanche). *Bull et mémo. Soc. de chir de Paris* 96 1u 2300.

The patient whose case is reported by Desplas was wounded by a bullet. The entry was at McBurney's point and the omentum protruded. The iliac orifice was a large wound in the right buttock with number of bone fragments. Operation was performed two and one-half hours after injury consisting in resection of the herniated epiploca, internal laparotomy removing the destroyed muscles. A double perforation of the cecum was found; the appendix was dragged away from its base. A part of the epiploca projecting into the external iliac fossa was resected and the cecal perforations sutured; the appendix stump was buried; the peritoneum of the internal iliac fossa reconstructed; the wound sutured and drainage instituted. All free fragments were removed from the wound in the buttock. A second intervention was made about ten days later for removal of fragments in the iliac region, etc. A third intervention was made six weeks later owing to symptoms of suppurative arthritis with osteomyelitic lesions of the neck of the femur verified by radiograph. This intervention consisted in resection of the head and neck of the femur, curettage of the acetabulum, trepanation of the trochanter and a ture of the gluteal wound. In little more than a month the man was able to walk with the aid of crutches. He has now recovered, with a shortening of 6 cm. in the limb.

This case the author believes shows the efficacy of intervention in visceral injuries when the time between the injury and operation is short. Also the great benefit of decapitation of the femur in suppurative arthritis of the hip-joint and the excellent functional results obtained from it.

All operations were done under spinal anesthesia. W. A. BRECKMAN.

Mertens: Abdominal Gunshot Wounds at the Front (Bauchschüsse im Felde) *Beitr. z. klin. Chir.* 1916 c, *Kriegschir.* H 16 335

The author's experience is based on his observations during the battle on the Yser canal in a field hospital 4 to 5 km. behind the trenches. He observed 123 perforated abdominal gunshot wounds 91 with and 32 without gastro-intestinal injuries. In the 91 injuries of the first category 35 were clean injuries of the gastro-intestinal canal. Of these 22 were operated upon with 40.9 per cent recoveries 12 were conservatively treated with 16.6 per cent recoveries. Of 56 gastro-intestinal wounds combined with injuries to other organs 5 were operated upon with 20 per cent recoveries 51 were conservatively treated with 11.5 per cent recoveries.

Of the 32 perforated abdominal injuries without gastro-intestinal injury 6 were operated upon with 100 per cent recoveries. Of all perforated abdominal injuries 37 per cent recovered.

From the author's experience with the transportation of such patients by ambulance, automobile and train, he considers rail transport the most satisfactory. Operation is if possible deferred for a few hours after arrival of the wounded during which time they are observed and receive treatment by digitalis, salt infusions, morphine stimulants, etc.

Most of the intestinal injuries were large lacerations. Only in a few instances was the intestine entirely perforated by the projectile. In 10 of the cases there were more or less large prolapses. Such wounds show a small perforation of the parietal peritoneum through which the prolapse occurs, a large rent in the muscle, the external entry orifice being smaller.

There were 3 clear stomach gunshot perforations, 10 clear large intestinal, 16 clear small intestinal and 13 clear liver perforations.

Regarding diagnosis abdominal tension, with sensitiveness on pressure combined with costal respiration indicate an intestinal injury or a hemorrhage. In hemorrhage the tension is not so great. To find the site of an intestinal canal injury the author gives this sign twice repeated. If the tense abdominal wall is tapped energetically by the finger tip or a percussion hammer the patient will feel a violent pain where the injured intestine adjoins to the abdominal wall.

Besides the 123 perforated abdominal wounds 30 other abdominal wall injuries were observed. The author refers to the fact that when a projectile hits the abdomen there is an instant contraction of the abdominal muscles due to the pain. The result is that many missiles which in a relaxed condition would certainly perforate the peritoneal cavity pass extraperitoneally. Of the injuries reported, 74 were rifle bullet wounds, 29 grenade wounds, 7 shrapnel wounds the balance being mine and other wounds.

Mertens' experience causes him to favor early operative treatment of abdominal gunshot injuries, at least in trench warfare. W. A. BRENNAN

Béclère, A.: Radiotherapy of Intra-abdominal Neoplasms of Testicular Origin (La radiothérapie des néoplasmes intra-abdominaux d'origine testiculaire) *J. de radiol.* 1916 II 287

Béclère reports the case of a man of 35 who when first seen in 1911 showed a hard solid tumor which occupied all the left half of the abdominal cavity passed the median line, and extended to the right. His history showed that an ectopic testicle had been removed about three years before. The present tumor appeared about two years later. Various physicians and surgeons who examined him had considered the tumor as an intra-abdominal recurrence, probably splenic of the primary neoplasm, and had judged it inoperable. Radio-treatment was begun in May 1911 and seven days later after the third sitting the tumor had already noticeably diminished in size. Toward the end of October the patient who was under continuous treatment had recovered 24 kilograms of weight, his appetite was excellent and he had the appearance of a man in perfect health. There was no sign of the tumor on palpation. However on account of a slight edema of the lower limb the author fearing a recurrence resumed irradiations from December 1911 to July 1912. This resulted in a cutaneous lesion which developed into an ulcer. This was surgically treated with perfect success. The recovery has been maintained for the past three years. Béclère considers this case the most extraordinary success obtained by him in the course of 12 years practice.

W. A. BRENNAN

Pybus, F. C.: A Case of Large Omental Cyst in a Child. *La cel. Lond.* 9 7 cx II 63

The case is reported of a girl, aged 4 years, who was admitted to the hospital in June 1915 presumably suffering from tuberculous peritonitis. It was noted that the child's abdomen had been swollen since she was nine months old. She had been tapped on two occasions at the ages of eighteen months and two years but on each occasion the fluid gradually returned. After admission she was again tapped six pints of fluid being removed. The circumference of the abdomen was 29.25 inches.

At operation a thin-walled cyst was found occupying the larger part of the abdomen. The cyst was tapped and drawn outside the abdomen. It was thin-walled, partially loculated and situated in the great omentum. It was readily stripped from the omentum except at one part where the omentum was torn and its upper part had to be peeled from the greater curvature of the stomach. The omentum was repaired, completing the anterior wall of the lesser sac. The abdomen was then closed. The child made a perfect recovery and was discharged a fortnight later. The cyst was the size of a large football. The exact quantity of fluid was not measured but half-filled an ordinary pail. Microscopic examination of its wall revealed no epithelial layer so that it is difficult to account for its origin.

EDWARD L. CORNELL

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Litchfield, L.: Osteomalacia. *Penn. M. J.* 96
xx 6

The author briefly considers the subject of osteomalacia, giving some of the newer theories and aspects of this disease.

The first symptom is usually muscular weakness, especially noticed in going up or downstairs followed shortly by pain through the back, hips or extremities which is increased at night. Icteric neuralgia is common. The joints particularly the large ones, become ankylosed and the long bones bowed. The bones in general become softened and distorted by strains such as muscular efforts. Spontaneous fracture is common.

The disease is usually intermittent for several years and is commonly associated with child bearing. The intermittent periods gradually shorten the symptoms become more pronounced and a chronic condition ensues. There is a type occurring in elderly people and tracking only the spine and the pelvis which is called osteomalacia senilis. The disease is common in Italy, Switzerland and Germany; rare in France, England, and the United States.

A considerable discussion is given of the various theories as to the etiology that have been advanced from time to time, the most accepted idea today being that it is due to a disturbance of the internal secretions chiefly suprarenals and hypophysis.

Histologically the bones show a formation of osteoid tissue, organic matrix of bone without calcium near the haversian canals. In rachitis this is formed between the epiphysis and diaphysis.

Chemically the bones show a decrease of calcium and phosphorus and an increase of magnesium and sulphur salts.

In diagnosis the advanced case offers no difficulties but in the early case that diagnosis is often impossible. Rickets, Paget's disease, osteoarthritis, osteogenesis imperfecta and scorbutus are the diseases most often confounded with osteomalacia. The author finally inclines to the idea that these all may be but manifestations of the same disease. The roentgen rays are of great value in recognizing the skeletal changes characteristic of osteomalacia.

In the treatment efforts must be directed toward favoring normal calcium metabolism. Plenty of air and sunshine, foods high in the value of calcium and phosphorus, the administration of phosphorus, and castration are among the principal therapeutical remedies used. Lately Bona has advocated the prolonged use of hypodermics of adrenalin—0.5 to 1 cm. of a 1:1000 solution once daily—and has reported remarkable results: 70 to 50 injections

having been used in some cases. Pregnancy should be prevented.
P. M. CHASE.

Nadler, W. H.: The Relation of the Endocrine Glands to Osteomalacia. *Endocrinology* 97
140

Nadler discusses the various theories that have been put forth as the cause of this strange malady and particularly glandular interrelationships, especially between the ovaries and the thyroid and adrenal glands as playing some part in the causation of the disease but he concludes finally that in the present state of our knowledge, there is no real evidence that the frequent and manifold manifestations of endocrine disturbance occurring in osteomalacia are a cause rather than an expression of the same metabolic disorder. Certainly the author states, the action of no one gland or glands may be considered as the causal factor. The conception of osteomalacia as an exaggeration of normal bone catabolism seems to him worthy of consideration, and it is hoped that further studies may indicate an influence of the endocrine glands upon such metabolism.

GEORGE E. BRILEY

Kidner, F. C.: Calcified Hematomata. *J. Am. M. A.* 109 77

Kidner reports a case of calcified hematoma in a boy following an injury to the thigh. Of the various views offered in explanation of the cause of this condition that suggested by Fay seems the most logical in that the fibrous tissue and periosteum both take part.

He thinks that the pathological explanation of the process is that the original trauma tears deep muscle fibers and at the same time causes a break in the periosteum. From both sources hemorrhage ensues and immediately the deeper layers of the periosteum respond to the stimulation of the trauma by pouring forth osteoblasts. These are free to wander throughout the mass, ultimately producing bone in all directions.

In the author's case the mass was found intimately adherent to the femur and in his opinion had the hemorrhage laid deeper in the muscle, or had the tear in the periosteum been smaller. It would be easy to see how the connection with the bone might have been severed and the bony growth have become entirely enclosed in the body of the muscle.

D. L. DEWEAN.

Latatu, M. C.: Contribution to the Surgical Complications of Osseous Nature of Typhoid Fever (Contribución al estudio de las complicaciones quirúrgicas de naturaleza ósea de la fiebre tifoidea). *Rev. d. med. y ciruj. Habana*, 1927, xlii, 7.

The author reports three cases of bone complications consecutive to typhoid fever, there being no other etiological antecedents in the histories. In

two of these cases, men of 29 and 38 years old respectively the lesion was, according to the author a true typhoidal osteomyelitis. In the third case a woman of 23 the lesion was more superficial and is described as a subperiosteal abscess of the same origin. In the two first cases in which fistulae were established the author made a trepanocannulation making a wide and ample opening of the affected mass of bone followed by sequestrectomy and drainage. In the abscess case on exploration part of the tibia was found denuded of periosteum. There was abundant pus secretion, which was treated by drainage only. Eberth's bacillus was demonstrated in the secretions in one case. W. A. BREXMAN

Joaristi V. Ischemic Contracture (La contractura isquemica). *Prog. clin. Madrid*, 1916 IV 321

Joaristi gives the details and illustrations of several reported and personally observed cases of Volkmann's ischemic contracture. From an elaborate study of these he draws these conclusions:

1. Ischemic contracture is a deformity consecutive to degeneration of the muscular tissue of the antebrachial flexors which is most frequently caused by compression exerted by circular rigid bandaging around a fractured part. The aspect is that of a clutching hand it results independently of lesion of the nerve trunks and is accompanied by inconstant disturbance of sensation motility nutrition and electric reaction.

2. The muscles of the hand generally preserve their functions even though they may be atrophied on removal of the bandages they resume their condition and may even become hypertrophied.

3. It is important to spread the knowledge of the onset of this disease so that it may be avoided.

4. There is no curative treatment operations upon the tendons have only a corrective value others (operations on the nerves or the bone amputations) should be rejected. The fundamental idea in this treatment is that impotence is due to the fact that the contracted muscles impede the functions of the healthy ones which then nearly always atrophy a tenotomy of these may free them or the muscles of the hand may in great part supply the necessary functions of the forearm.

5. In very marked degeneration of the muscles of the forearm any plastic operation is useless neither anatomic synthesis nor other procedures have in such cases any superiority over simple tenotomy in the fingers and in the wrist. And therefore in those cases in which some of the muscular faculties appear to be preserved the inefficacy of such plastic operations is not to be doubted as they do not bring any new living element and only provoke the excessive production of cicatricial connective tissue thus hindering the delicate function of the tendons and favoring the appearance of secondary contractures.

6. In the actual state of present knowledge Joaristi prefers simple tenotomy for ischemic contracture to any other operative procedure and he pro-

poses in future cases to make a graft of some healthy muscle although without great enthusiasm since the slight value of such grafts in the forearm have been demonstrated in infantile paralysis cases.

W. A. BREXMAN

Taylor A. S.: Volkmann's Ischemic Paralysis and Contracture. *Ann. Surg. Phila.* 1917 lrv 28.

This paralysis is not uncommon and is almost always due to poor initial treatment of injured extremities. It occurs in children between one and four teen years of age and is almost always secondary to fractures about the elbow and upper forearm region in which the primary treatment causes serious interference with the circulation plus direct pressure at or below the site of fracture. The etiological pathology is proved clinically and experimentally to be primarily a myositis although in many cases the loss of motion and rigid contraction occur simultaneously. Since a nerve injury or complete arterial obstruction or both cause only a flaccid paralysis, and since contractures then occur not in the paralyzed muscles but in their opposites, the condition cannot be primarily nerve or artery damage. Volkmann first believed the condition to be due to interference with arterial supply plus a venous congestion. Experiments of direct muscle compression for more than six hours will cause this condition but like compression to corresponding nerves or arteries will not. The picture of white avascular inelastic muscle tissue is followed by cicatrix and contracture and there may be complicating lesions of nerves and vessels passing the elbow especially the ulnar and median nerves. Anatomically the whole flexor group of muscles is surrounded by a firm unyielding covering of aponeurosis and bone. When this pressure is increased and in addition tight splints etc are used ischemic paralysis and contracture are produced. The myositis is replaced by connective tissue.

The symptoms are immediate pain swelling and cyanosis of fingers which disappear after a few days remote, loss of motion resistance to passive motion and a palpable brownish mass over the muscle. Flexion contracture of the fingers is progressive for three months in the early stage consisting of flexion of the second and third phalanges with extension of the metacarpophalangeal joint and flexion of the wrist. The complicating nerve injury may be primary at time of accident with loss of function sensory and motor secondary to the pressure of muscles or later from the pressure of cicatricial contractures. This loss of power especially of the ulnar nerve may be detected by examination of the intrinsic muscles of the hand not involved by the ischemic process.

The prognosis is generally unfavorable, but depends upon the amount of muscle damage, which is often hard to measure even by electrical tests. Prophylaxis consists in early fracture reduction and immobilization, gentle manipulation, loose dressings elevation of extremity constant inspection for swell

ing with removal of all splints as indicated with simultaneous splitting of aponeurosis if necessary and gentle passive motion of fingers.

The treatment may be operative or mechanical. The operative treatment consists in lengthening of the flexor tendons or shortening of the bones. Either must be followed by vigorous after-treatment.

The mechanical treatment consists in stretching (1) Splints. The wrist is placed in complete flexion which allows full extension of fingers the fingers being held by splints in extension and the patient instructed to work at extending the metacarpophalangeal joint which when accomplished is held by a long splint holding all in extension (2) Elastic traction in method of Robert Jones which consists of a brace fitted to the forearm provided with apparatus over the back of the fingers to make the desired amount of elastic traction. Prolonged nerve injury should be inspected by operative exploration.

Three illustrative cases are cited which tend to show the advantage of the mechanical treatment over the operative. R. G. PACKARD

Edmond W., and Galbreath, W. W. Gunshot Injuries to the Knee-Joint. Some Suggestions with Regard to Their Treatment. *Br. M. J.* 9 6 2, 714

The authors classify types of injury and infection seen, with gunshot injuries to the knee joint. The general treatment outlined depends somewhat upon the type of infection, and the treatment is often based upon the pathological report as to the nature of the fluid in the joint and on the X-ray report.

They classify the types of organisms as follows (1) mild infections enterococcus (2) moderate infections, streptococcus brevis staphylococcus, bacillus coli, bacillus aerogenes capsulatus (3) severe infections streptococcus longus

Under treatment the following points are emphasized

1. Aseptic without fracture area cleaned wound untouched or opened small bullets left large foreign bodies removed if further trouble is expected mobilizing dressings used

2. Moderate mild sepsis without fracture joint irrigated with saline one dram 0.5 per cent eusol injected hourly through one of two tubes, one tube acting as drain mobilizing dressings applied.

3. Acute sepsis without fracture knee joint opened two incisions made one on each side of patellar tendon joint capsule opened, knee irrigated with saline suprapatellar pouch opened by lateral incisions eusol injected every two hours Thomas splint used.

4. Aseptic with fracture removal of missile, knee joint not touched unless there are signs of infection continuous eusol irrigation of the fractured bone.

5. Acute or moderate sepsis with severe fracture often amputated sometimes excision of the knee-

joint is best treatment knee joint left wide open, salt or eusol irrigation. Thomas splint used with extension with knee in slight flexion.

The article is difficult to abstract in complete detail and it is reported only as a preliminary outline of the work the authors are doing.

C. C. CHATTERTON.

Serafini G. Tibial Pseudarthrosis of Congenital Origin (Pseudarthrosi della tibia di origine congenitale) *Pedici e. Roma*, 9 6 xrfii, sez. chir. 355

Serafini reports a case of congenital tibial pseudarthrosis. At birth there were no external symptoms to suggest the presence of any alteration in the tibia but at the age of six years, following a slight trauma a fracture at the union of the middle third with the lower third of the tibia was produced. The fracture did not consolidate and a pseudarthrosis resulted which resisted every attempt at bloodless treatment. He came to Serafini's attention at the age of sixteen years.

Serafini reviews the various operative procedures reported in the literature for the correction of this deformity. In the case of his own patient he resorted to the pseudarthrosis *en bloc* made a double oblique osteotomy of the hypertrophied fibula, and a metallic suture of the two tibial fragments. Radiography had shown that the tibia although of diminished size presented a strong dense shadow which led to the hope of a firm reunion of the fragments. In making the tibial resection the author was careful to remove a larger tract of the lower tibial segment than of the upper believing that the power of nutrition of the latter was greater than that of the former.

A radiograph taken eighteen months after operation showed callus formation about the resection well constituted and dense. The fibula showed normal callus in the two sectioned parts. At the site of union of the upper and middle thirds of the tibia there exists the callus of a fracture produced during the corrective maneuvers after the tibial resection and fibular osteotomy. It is well constituted which shows that in that section of the tibia the osteogenic power of the bone and periosteum is good. There is a shortening of about 5 cm. in the left leg. While the tibia and fibula preserve a slight inflexion and external convexity objectively the patient shows perfectly straight legs. W. A. BROWN

Tanton, I. Vicious Calluses of the Instep (Callosités du cou-de-pied) *Rev. de chir.* 9 6, xxv 78

Every faulty consolidation of an ankle fracture is due to rupture of the equilibrium between the foot and limb. This equilibrium is double, lateral and anteroposterior. Lateral equilibrium depends on malleolar integrity anteroposterior equilibrium depends on the integrity of the mortising surfaces. A logical classification of such lesions follows these concepts a group in which vicious consolidation

follows loss of lateral equilibrium and a group following loss of anteroposterior equilibrium.

Tanton considers these groups as follows:

1. Vicious consolidation destroying lateral equilibrium (1) with external deviation of the foot, flat foot traumatic valgus (2) with internal deviation of the foot traumatic varus.

2. Vicious consolidations destroying anteroposterior equilibrium. There are two distinct types (1) with flexion of the tibial bulb in an area of sub-articular fracture (2) with displacement of the foot in its tibiotarsal articulation. The first type is shown in the circular incurvation of the limb the second by luxation or subluxation of the foot.

3. Vicious consolidations destroying simultaneously both transverse and anteroposterior equilibrium (1) supramalleolar fractures (2) mortising fractures.

From a consideration of these so-called secondary deviations consecutive to bimalleolar fractures Tanton concludes that they are secondary in appearance only, that they are not the result of trophic disturbances but of an insufficient reduction of the primary deviation. The process occurs primarily in the foot and not in the callus. The foot first deviates and its deviation effects the secondary deviation of the fragments. There is an insufficient reconstitution of the tibiofibular mortise.

In treatment radiography is indispensable it will show the cause and degree of the primary displacement of the foot which knowledge is indispensable in the choice of intervention. There are two types:

1. Primary supramalleolar fracture the situation of the deformation being subarticular.

2. The fracture involves the mortise the situation of the deviation being intra-articular.

In the first type the intervention is either osteotomy in the vicinity of the fracture of supra articular osteoclasis. In the second category of cases intervention has for its object (1) the re-establishment of the harmony between the pressure centers of the tibia and astragalus and as a consequence reduction of the displacement of the foot (2) the reconstitution of the fibular mortise and particularly the restoration of its transverse dimensions.

Every intervention which is not directly applied to the cause of the deviation is *a priori* insufficient and even if there is a temporary favorable result the deformity will be reproduced. Hence supramalleolar osteotomy applied to the correction of vicious consolidation in mortising fractures is condemnable also linear osteotomy as well as subarticular osteoclasis. The ideas which dominate the treatment of vicious consolidations about the ankle are integrity or alteration of the tibial extremity and the age of the lesion. Tanton generally favors bimalleolar osteotomy followed by complete reduction of the diastasis. The first part of the intervention consists in oblique osteotomy of the internal malleolus at its base and the removal of hyperostoses. The second part includes osteotomy of the fibula

the adjustment of malleolar fragments and correction of the diastasis. In some cases where there is considerable tibiofibular diastases with fibrous ankylosis etc tibiofibular resection or astragalec-tomy or tibio-astragalian cuneiform resection may be necessary.

W. A. BRYENMAN

Davidson A. J.: Claw foot or Clawed Toes
Therap. Gaz. 1917 xli, 13

Claw foot or multiple hammer toe occurs in varying severity. In the mild cases the toes are in the position of dorsal flexion and the anterior arch is flattened — this deformity is of posture and is easily capable of correction. In the moderately severe cases, the toes are further flexed the depression of the anterior arch is more conspicuous the dorsal tendons are definitely contracted the metatarsal heads are depressed and prominent on the sole — the foot is much shorter and thicker. In the most severe cases the toes are strongly dorsal flexed at their metatarsophalangeal joints and dislocated and plantar flexed at their interphalangeal joints the transverse arch is reversed and the front part of the foot thickened. Resulting callouses and ulcers make the patient protect his forefoot by walking on his heel.

The condition is not congenital but is often familial. The short narrow pointed shoe or high narrow heel is the most common cause, but occasionally an unrecognized attack of infantile paralysis is the etiology.

In mild and moderately severe cases improvement may be obtained by restoring the muscular balance and function to the intrinsic muscles of the foot. Faulty footwear and all forms of rigid support should be discarded and a flexible low shoe with a thin sole and low heel worn. Forceful stretching of contracted tendons exercises, and baking of feet are valuable. The wearing of Cook's anterior heel often produces good results. In other cases multiple tenotomies are indicated to release contractures, and the tendo achillis may have to be divided. Probably the best operation for correcting the contractures is that of Hoffman, in which the field is reached by a transverse curved incision on the sole just behind the web of the toes and the heads and parts of the necks of the several metatarsals exposed and excised sufficient in amount to relax all contractions and to permit of free motion and proper alignment. The results have been remarkably good there is no tendency to recur and the relief is permanent.

R. G. PACKARD

FRACTURES AND DISLOCATIONS

Pilcher L. S. Fractures of the Lower Extremity or Base of the Radius. *Ann. Surg.* Phila., 1917 lrv 1

The author has avoided the name Colles in referring to fractures of the base of the radius because the name has been associated with erroneous views of the nature and cause of the injury and because

he prefers descriptive names in anatomical terms of surgical conditions.

A fall in which the force is broken by an outstretched arm with the hand in extension is the usual condition under which a fracture of the lower end of the radius occurs. Strain is brought to bear on the projecting anterior lip of the base of the radius, the first row of metacarpal bones slips as it moves in the cup-like cavity of the articular surface of the radius, the force is transmitted as a cross-breaking strain upon the bone into which the ligament is inserted and a portion of it is torn off. The anterior radiocarpal ligament, which is very firm and strong, is inserted for one-fourth of an inch above the articular margin. This can readily be demonstrated in the cadaver although sometimes the anterior ligament gives way and a fracture of the scaphoid or semilunar results. The shape of the fragment of the radius and the direction of the line of fracture bear a constant relation to the strength of the three fasciculi which compose the anterior radiocarpal band.

In the ordinary accidents, the remains after the force of avulsion is expended the downward impulse of the radius which varies with the body weight and the velocity of the fall. If the force acts quickly it may drive the convex articular surface of the carpal mass into the concave surface of the radius, splitting it, causing stellate longitudinal lines of fracture of the radial base. Much more frequently however especially in those injuries resulting from a fall from a height, the downward force acts after the transverse lesion has been accomplished. Unless the backward movement has been sufficient to carry the lower fragment out of the way, it is broken into more or less numerous secondary fragments. Occasionally the force is so great that the lower fragment is split into numerous small fragments which are driven off in various directions. This causes marked shortening of the radius and outward protrusion of the head of the ulna.

The usual typical displacement is movement of the lower fragment toward the dorsum. The carpus as it is pressed upward and backward by the impact of the fall tends to carry the fragment of the radius with it, the movement being limited only by the fibrous bindings. The immediate effect of the backward slipping of the carpal fragment is a movement of rotation in the direction of supination, the carpal mass around the ulnar head. Not infrequently the strain on the carpo-ulnar ligamentous fibers is so great that the styloid process of the ulna is torn off and the broken lower end of the radius is thrust forward, giving the lower articular fragment the appearance of having moved laterally. In falls upon the wrist with the hand in forward flexion, the lower fragment is displaced forward, but this type of fracture is quite uncommon. It may occur from a blow directly upon the dorsum of the hand over the articular expansion of the bone.

Up to the age when the conjugate epiphyseal cartilage becomes ossified—nineteenth to twentieth

year—a cross-break strain may result in the separation of the epiphysis only although the separation almost always occurs through the adjoining bone rather than through the epiphysis. Separations of this character are rare on account of the elasticity of the osteocartilaginous tissues of childhood. The arrest of growth in the radius as the result of an injury in this locality may occur although it is rarer than would be expected under the circumstances. Many injuries to the wrist are classed as sprains unless X-ray pictures are taken, in which event longitudinal fissures and other incomplete fractures will frequently be found. Under rest, repair rapidly takes place without deformity. Fracture of the ulna and fracture of the metacarpal bones are not common accompaniments, but occur frequently enough to make the surgeon bear them in mind, especially when a fracture of the wrist remains to derange for a long time.

The most common permanent alterations resulting from a fracture of the base of the radius are prominence of the head of the ulna with widening of the wrist and loss of the anterior projection of the articular lip of the radius and the imposition of a more or less backward inclination upon the plane of the carpal articular surface of the radius. The bony deformity even when marked usually entails but slight functional disability.

The treatment of recent fractures consists in dorsal hyperflexion to disengage the entangled fragments and while the hand is still in this position, extension with firm thumb pressure upon the back of the lower fragment pushing it forward into place. If the hand is now brought into palmar flexion while the extension and pressure are continued the fracture surfaces fall together and the normal contour of the bone is restored. The manipulations do not require a great deal of force. In those cases in which there is splintering of the lower fragment of the radius, simple extension with one hand while the fragments are moulded with the thumb and finger of the other hand is all that is necessary.

Some permanent shortening will result in all cases in which there has been much impaction. Ordinarily there is but little tendency to renewed displacement. Pressure brought to bear upon the palmar surface of the carpo-radial region may crowd that fragment back to the plane of the shaft while anteroposterior pressure tends to crowd the soft tissues in between the radius and ulna. A retentive dressing made of a graduated pad of the proper thickness and so placed that it shall shield the anterior lip of the lower fragment from pressure is the most necessary essential in treatment. This should be wide enough to give lateral support to the ulna. For the purpose of immobilization equable compression with a flannel roller is usually sufficient. Allowance must be made at first for swelling and then the bandage tightened. The arm is supported on its ulnar side by a narrow sling which does not extend forward beyond the distal end of the ulna, in which position the weight of the unsupported hand

and wrist is an additional force tending to press the ulna into position. In some cases especially in children or in the careless a splint is advisable. Many forms have been invented but most of them are based upon misconceptions of the nature of the fracture. The Coover turblinated splint is an exception to this statement and one which will give excellent results in case it is properly applied. Any form of dressing should be removed at the end of about one week and massage and passive motion employed each day keeping the wrist bandaged in the meantime.

In cases which have healed with deformity excellent function is the rule. However in cases from three to six weeks old there still remains ground for improvement by rebreaking the new bone if necessary with an incision and a chisel and correcting the deformity. In a number of cases the author has made an incision on the dorsum of the wrist and after drawing aside the perosteoligamentous-tendinous flaps, chiseled through at the site of the fracture loosening whatever was necessary to restore the fragment to normal position. It may then be treated as a fresh fracture. The article contains many excellent drawings and X rays which illustrate almost every phase of fracture of the base of the radius.

GARDWOOD

Whitbeck, B. H.: Fractures of Neck of Femur in Childhood. *Am. J. Orth. Surg.* 1917 xv 17

The author states that fracture of the neck of the femur in childhood was not recognized until Whitman reported a case in 1890. In recent years there have been many cases reported due to the aid of the X ray. The failure in former years to make the diagnosis may be ascribed to the symptoms and physical signs in this class of cases, and the subsequent course. Fracture of the neck of the femur in childhood does not usually entail the immediate helplessness and persistent disability that are associated with the injury in adults.

The usual forms of treatment have been for the most part disappointing because they do not accomplish the complete reduction of the deformity and retention in the corrected position. The principles on which the treatment of a fracture of the femoral neck should be based are

- 1 The immediate and complete reduction of the deformity no matter of what type.
- 2 Effectual means of fixation to allow union to take place.

Whitbeck details the history and treatment of his two cases

1 The first case presented a fracture at the epiphyseal junction with complete separation of the fragments and marked angulation. The thigh was rotated outward and hyperabducted. Under anesthesia the leg was adducted rotated inward and drawn down parallel and equal in length to its fellow. Plaster spica was applied from the nipples to the tips of the toes and left for seven weeks then

crutches were used but standing on the affected limb was not allowed for six months.

2 The second patient had a fracture of the femoral neck near the epiphyseal junction with marked angulation. The thigh was adducted and rotated outward. The treatment was similar to that instituted in Case 1 except that the leg was gradually abducted and rotated inward.

PHILIP LEWIS

Brooke, J. A.: The Results in Treatment of Fractures of the Neck of the Femur. *Hahnemann Month* 1916 ii 806

The author reports 22 cases of fracture of the neck of the femur treated by Hull and himself with the Whitman method. These ranged from the ages of twenty-four to ninety-seven years, and were fractures of all varieties subcapital intertrochanteric, pterotrochanteric complete incomplete and impacted.

In every case where possible an X ray was taken to confirm the diagnosis and to show the position of the fragments. Pictures were also taken after reduction to show the apposition of the fragments.

Every patient was anesthetized the fracture reduced and the fragments brought into anatomical relationship this position being fixed and maintained by a long plaster of Paris spica, extending from the toes to the nipple line, the limb being in full abduction. In an impacted fracture showing shortening and deformity the impaction was always broken up by a hinge-like motion and readjustment of the fragments secured. The plaster was allowed to remain unchanged for a period of ten to twelve weeks after removal of the plaster spica the patient remained in bed for two or three weeks then was out of bed to a chair and from the chair to crutches later supporting a certain amount of his weight by a cane. The older cases were not allowed to bear full weight upon the leg till at least ten or twelve months had passed.

The patient, aged ninety-seven years, died. In the case of the two aged eighty-two and eighty-four no effort at reduction could be made, owing to their poor physical condition. In the 2 cases aged fifty-five and sixty-six respectively, non union was present four months after injury. The remaining 17 cases were able to be up and about a walking with the support of two canes and a depending on crutches. There was good union, without deformity in each of these cases, and in only 2 of them was there any appreciable shortening shown and that only one-half inch.

The functional results in these 17 cases were evidently almost perfect. The author believes that no other method of treatment would so quickly give results in this class of cases. To secure these results, he believes, however that it is necessary to perfectly understand the fundamental principles of this plan of treatment together with the knowledge of the use and application of plaster of Paris.

A brief review of the abduction method of treat-

ment is given and the advantages of this method over weights and bags and long external splints cited.

Brooke believes that one secures a complete reduction of the fracture, secure apposition of the fragments — which apposition is maintained till union takes place — by the above method and that the patient is more comfortable, can be moved in bed or placed on a cot, turned and moved, without danger of disturbing the relationship of the fragments.

The open operation, he believes, is rarely indicated excepting in the epiphyseal separation of adolescence and in the older cases, where non-union persists or where the fracture is so displaced as to be irreducible by ordinary manipulation.

E. C. ROBERTSON

Sheldon R. F. A Study of the X Rays of Cases of Fracture of the Long Bones of the Massachusetts General Hospital. *Boston Med. & Surg. J.* 97: 1191-6

The long bones of the lower extremity form the basis of Sheldon's report and his results were as follows:

Fract. 57 cases, seat of fracture

| | |
|--------------------|----------|
| Head | |
| Neck | Impacted |
| Not impacted | |
| Inter-trochanteric | |

Shaft: Upper one-third
Middle one-third
Lower one-third

Tibia and Fibula, 405 cases, located as follows

| | |
|---------------------|-----------------|
| Upper end | |
| Tibia | 8 |
| Fibula | |
| Shaft | |
| Both bones | 91 9 3 per cent |
| Tibia | 7 7 per cent |
| Tibia, obliquely | |
| Fibula | |
| Middle or lower end | 69 69 per cent |
| Both bones | 69 69 per cent |
| Tibia | 44 44 per cent |
| Fibula | 25 25 per cent |
| Multiple | — |
| | 405 |

Of the eight fractures of the upper end of the tibia all entered the knee-joint.

The position of the 9 shaft fractures was as follows:

| | Both | Tibia | Fibula |
|--------------|------------------|--------------------|--------|
| Upper third | 4, 7 7 per cent | | |
| Middle third | 3 3 per cent | 24, 20 20 per cent | |
| Lower third | 22, 3 3 per cent | 24, 3 3 per cent | |
| Tuberosity | | | |

The 166 lower end fractures practically belong in the Pott's fracture group, thus 11 of the 4 fractures of both bones are definitely of the Pott's type, and of the 44 fractures of the tibia alone, 40 involve the internal malleolus only. The 108 fibula fractures occur anywhere in the lower four inches of the shaft.

SURGERY OF THE BONES, JOINTS, ETC.

Comblair and Murard. Primary Economic Operations on the Foot (Des interventions économiques primaires de pied). *Bull. et mém. Soc. de chir. de Par.* 9: 631

The authors who operated in a surgical ambulance have made 3 interventions of the foot, 4 amputations and 28 resections. The guiding principle has been to preserve as much as possible of the foot and to avoid amputations if there was any possibility.

Twenty-one of the operations were on the foot and 11 on the ankle. Of the 21 foot operations, 14 were primary and 7 secondary. The primary operations included 3 amputations and 11 resections. Two of the amputations were of the Lisfranc technique and recovered. One patient on whom a Syme amputation was performed died after a secondary thigh amputation. Of the 11 resections 5 were total with 3 recoveries, the other 6 required secondary amputation. Among those who had partial resections done there was 1 death.

The secondary operations included 3 partial resections of the cuboid — 3 recoveries, one with some fever, 1 anterior incomplete tarsectomy — recovery, 1 resection of head of astragalus — recovery. Prognosis operation — secondary amputation of the thigh necessary, 1 total resection of calcaneum — recovery with phlebitis of opposite thigh.

W. A. BRIDGES

Campbell W. G. Bone and Joint Affections Treated by Röntgen therapy. *Am. J. Orth. Surg.* 9: 27-31

Campbell has been using the Rollier method of treatment since March, 1913. He has simplified the method as follows: beginning above at the neck, with the head shielded, and below at the feet, exposing from 2 to 4 inches of the body surface for five minutes twice a day, increasing the time and surface at this rate until the entire body is exposed. The time of insolation is then increased according to the tolerance of the individual. Some do better with eight to ten hours under the direct rays, others can stand only three or four hours. All spinal and hip cases are kept in one position until acute symptoms have disappeared and the body is well pigmented, when the other half is exposed. Great care is necessary at all times to prevent dermatitis.

Improvement is usually synchronous with pigmentation and negroes respond to heliotherapy equally as well as whites. The X-ray findings are the most efficient guide after clinical symptoms have subsided. After a few months of insolations a material change is noted. Evolution of the process is evidently hastened, necrotic areas are being absorbed, the bone becomes more opaque and by the end of six months, is often thicker than normal and apparently ankylosed. The inflammatory exudate becomes irregular and thinner gradually diminishes in circumference or at times undergoes calcification. In joints the process is analogous.

Campbell's experience does not bear out Rollier's

claim that joints, apparently destroyed are mobilized and that well marked kypbores diminish and disappear. He has treated 30 cases of bone and joint tuberculosis and 21 non-tubercular cases.

The author concludes as follows:

1 Apparatus and orthopedic measures which do not prevent exposures are essential to success in tubercular affections of bones and joints.

2 The X ray produces relatively greater improvement in six months than would occur in years with older methods.

3 The treatment of tubercular sinuses and abscesses by heliotherapy has been far more satisfactory than with other methods of treatment.

4 Heliotherapy is equally effective in whites and negroes who undergo deeper pigmentation, regardless of color.

5 It has proved beneficial not only in tubercular conditions but in other affections, especially osteomyelitis and acute sepsis.

6 It can be given satisfactorily but with difficulty in private homes and general hospitals though special institutions would greatly facilitate the treatment and give a greater proportion of cures.

PHILIP LEWIS

Mayet H: Oseous Sutures with Chromicized Catgut (Sutures osseuses au catgut chromé) *Paris chir* 1916 viii, 248.

The author is of the opinion that in general metallic sutures are not satisfactory in the joining of bone surfaces. The material is not supple it cannot be knotted and the twisted ends form a projection which later becomes invested with periosteum and forms a rough knob which is painful to the touch, particularly if close to the tegument. Moreover it is a permanent foreign body which in the course of time breaks up under the action of the acids contained in the blood and serum and the fragments traveling to distant tissues give rise to various troubles.

Mayet finds in chromicized catgut No 2 a suture material which avoids the inconveniences of metallic sutures and is less liable to cause infection. The results which he has obtained from its use in his practice for several years past strongly encourages the continuance of its use. In osteoperiosteic grafts for fractures of the rotula and of the olecranon he has employed it successfully. Coaptation of the fragments has always been obtained and osseous cicatrization is effected as easily as with metallic threads. The catgut is resorbed at the end of two or three months which is one of its principal advantages over metal.

W A. BREZMAN

Tanton and Alquier: Traumatic Resection of the Hip for War Injuries (Résections traumatiques de la hanche pour blessures de guerre) *Bull et mém Soc. de chir d Pa* 1916 xliii 2804.

The authors have made 10 secondary hip resections for infected war wounds. In 8 of these cases, clinical examination showed evident suppurative

arthritis of the hip consecutive to a comminutive open fracture of the superior extremity of the femur. These secondary resections were made relatively early varying from the second to twenty-second day after injury.

Whatever may be the anatomic lesions and the conditions of the articular infection suppurative arthritis of the hip is characterized on the one hand especially by general phenomena (rise of temperature, rapid and small pulse, etc.) showing a deep infection of the organism and on the other hand by local symptoms (infection at the base of Scarpa's triangle, oedema of the root of the thigh pain on pressure of the head of the femur etc.)

In the presence of lesions juxta or intra articular of the hip the surgeon should be guided by two considerations (1) to prevent or cure infection (2) to preserve the function.

The treatment varies according as the patient is infected or not and according to his being seen in an ante-febrile or intra-febrile period. Daily experience has demonstrated the value of very early and complete surgical intervention in obtaining an aseptic condition of wounds. The transformation of an osseous wound due to a projectile (always infected) into an aseptic wound depends on the operative act alone. In cases where such primary disinfection is checked secondary resection is indicated done as early as possible, intra-febrile intervention being much more grave than ante-febrile.

The general results obtained by the authors in their series of 10 secondary hip resections were 1 recovery with fibrous pseudarthrosis 1 ankylosis 6 anarthroses with restricted mobility 2 only recently operated upon and results not yet definitely established.

The authors believe that if subcapsulo-periosteal and done secondarily in the best period for osseous regeneration, extensive epiphyseo-diaphysary resections of the hip are capable of giving very good results.

W A. BREZMAN

Stell W F: Tendon Repair Without Actual Suture. *Practitioner Lond*. 1916 xcvi, 574.

Stell has successfully treated 26 cases of incised wounds of the extensor tendons of the thumb and fingers over the back of the first and second phalanges without suture. In only two of these both complicated by suppurative was there any remaining deformity or disability.

He outlines the treatment as follows: The finger should be maintained in a position of hyperextension for at least three weeks by means of a flexible aluminum splint. By manipulation of the splint it is usually possible to accomplish right-angle hyperextension at the metacarpophalangeal joint, with little or no discomfort. The terminal phalanx can then be hyperextended by means of padding. The skin cut should have fairly close approximation of its edges by means of sutures. No drainage whatever should be employed. Absolute asepsis is essential as regards the tendon-sheaths.

Stelll concludes that with these conditions strictly observed primary union will invariably occur between divided ends of the tendon without actual tendon suture. He considers this treatment preferable because it is simple, it involves the least risk of wound infection, and because it usually results in better extensor function than in cases in which the tendon-sheath has been damaged by instrument interference.

ALBERT EINHORN.

MacAusland, W. R. Astragalectomy (Whitman Operation) in Infantile Paralysis. *J. Am. M. Ass.* 9 7 12 41, 39.

The author has used astragalectomy for all paralytic deformities of the foot in the past six years. From his experience with 135 cases he has concluded that it is the only operation which gives stability in such cases. Tendon-transplantations and silk ligament suspensions are inadequate and it is illogical from a mechanical and physiological point of view to expect a restoration of balance by these procedures. Astragalectomy is indicated not only in calcaneovalgus deformity to which it was originally planned but in all conditions even when only one muscle is paralyzed. His technique consists in the usual external curved incision, inversion of the foot, excision of the astragalus, and putting the foot upon a equinovalgus. His results have led him to discard, except in rare cases, all other procedures.

The discussion of this paper brought out many objections to the operation as a cure all. Seven of those discussing the paper expressed themselves as against such radical application of an operation which is of value only in selected cases. Two were inclined to agree with the author.

W. A. CLARK.

Mauclair, P. Pseudarthrosis of the Tibia Treated by Central Osseous Graft with a Piece of Fibula from the Same Side (Pseudarthrose du tibia traité par la greffe osseuse centrale avec un fragment de péroné du côté correspondant). *Bull. et mém. Soc. de chir. de P.* 9 6 11, 2933.

In the case reported by Mauclair the tibia had been fractured in October 1915. There was no tibial consolidation. The fibula had fractured a little lower and had consolidated.

In April 1916 a central osseous plastic reparation was made taking the osseous graft from the tibia, boring a hole. A radiograph taken three months later showed the graft already much atrophied. Nine months later a radiograph showed the bone much thickened and the graft no longer visible. It was in great part resorbed.

Mauclair thinks that the central osseous graft is much better than the peripheral osseous graft following Albee's technique, because the central graft provokes very intense central osteogenic reaction. In other cases of closed fractures where he has carried out a similar technique he has found this intense osteogenic production.

The patient has recovered and walks well. There is a shortening of eight centimeters.

W. A. BRENNAN.

Croft, P. Four Trials of Bone-Grafting for Losses of Tibial Substances (Quatre tentatives de greffe osseuse pour pertes de substance tibiale). *Pres. méd.* 9 6 p. 57.

Since the beginning of the present war the author had occasion to repair four cases of loss of tibial substance. This was effected by bone-graft, the graft being taken from the tibia above or below the lesion. The four cases have been successful inasmuch as two already walk and the two other cases have almost consolidated and are expected to walk soon. Full details of the four cases are given and illustrated. The points of interest in these observations are the loss of substance which reached as much as 5 cm. in front and 3 to 4 cm. behind, the size of the graft 9 cm x 7 cm, the embedding of the graft extremities in deeply situated tibial cavities, ligature of the graft extremities with bronze threads, absence of immediate suppuration, but the formation of a fistula, the relatively rapid consolidation since there is great progress observed within three months after grafting, consolidation without sensible modification of the form of the graft.

In the author's opinion it is very important that the graft should be taken if possible from the tibial ridge on the same side, with its periosteum and that it should be deeply inserted in the tibial fragments and sutured with bronze threads. A slight postoperative suppuration instead of being a disadvantage appears to hasten consolidation.

The graft with its periosteum acts like living tissue. It is not resorbed but preserves its form and volume, adhering to and fusing at its extremities with the tibial fragments.

W. A. BRENNAN.

Saunders, B. Is the Diagnosis and Conservative Treatment of Fractures About to Become a Lost Art? *Tex. St. J. Med.* 19 7 12, 353.

Saunders answers this question in the affirmative, claiming that the average end results of fractures are now treated do not show improvement over those of the older methods. The explanation probably lies in the lack of manual dexterity and mechanical skill due to the methods of the present day training. There is too much dependence placed in the ready-made X-ray diagnosis, and unjustifiable operations are being attempted in order to accomplish anatomical coaptation—measures neither justified by necessity nor the superiority of the results obtained.

R. B. CORRIE.

ORTHOPEDICS IN GENERAL

Flacher, L. Clinical Observations on the Diagnosis and Treatment of Polymyositis at the Willard Parker Hospital. *Med. Rec.* 9 7 12, 5.

At the Willard Parker Hospital during the epidemic of 1916 there were reported officially over

9 000 cases. The mortality ranged between 20 and 25 per cent. There probably were many more cases during the epidemic many not recognized—those of the abortive type—and many not reported owing to fear of hospital detention or too rigid quarantine regulations.

Research was stimulated in order to firmly establish the etiology of the disease. Flexner's deductions following the epidemic of 1907 that the virus gains entrance to the nasopharynx and thence permeates the cervical ganglion reaching the spinal centers where destruction takes place were corroborated.

The micro-organism, a vegetable parasite so minute that it passes through the ordinary filter has also been found in the spinal canal and in the intestines.

In one of the wards of the hospital every child examined had an abnormal throat with enlarged tonsils. From this fact alone the deduction can be drawn that a diseased throat with abnormal surroundings favors the development of this disease.

The mildest cases were of the abortive type many recovering before the diagnosis was established. The severer forms notably the bulbar type frequently ended fatally. The respiratory type, in which there was intercostal paralysis was a fatal form.

There was always a sudden onset of symptoms, more or less characteristic of meningitis. In young infants there was noted fever vomiting twitching refusal of food, apparent pain when the extremities were touched, and sometimes a condition resembling a semistupor.

Older children complained of headache pain in the back of the neck or in the spine, muscular pains or pains in the joints. There were so many types of fever seen that there seems to be no characteristic febrile curve that is pathognomonic of poliomyelitis. The fever usually persisted for from three to five days, but sometimes continued for from seven to fourteen days. Associated with the fever there usually was vomiting anorexia, peevishness extreme thirst, and a general sense of lassitude. Frequently an unsteady gait or swaying of the body was noted. The preparalytic symptom of muscular tremor or twitching described by Colliver in 1913 was noted in many cases.

As a diagnostic aid and to afford relief lumbar puncture was performed as early as possible. In most cases 10 to 15 ccm. of the spinal fluid were withdrawn. In some cases where the fluid was obtained under increased pressure, 30 to 60 ccm. were withdrawn to afford relief. The fluid was studied microscopically at the research laboratory associated with the hospital. It was definitely noted that an increase in the mononuclear cells usually denoted the presence of poliomyelitis. In many cases were found 50 60 100 and sometimes several hundred mononuclears in a cubic millimeter—the normal cell-count being below 10 to the millimeter. There were, however exceptions to this rule. The spinal

fluid also showed a strong albumin reaction and a marked globulin reaction likewise usually gave a strong Fehling's reaction.

The forms of paralysis most frequently met with involved the quadriceps extensor and usually also the anterior tibialis next in frequency were the upper extremity or muscles of the neck and arm and facial paralysis. Drop-foot and drop-wrist were commonly noted. There were many cases of intercostal paralysis. In cases of respiratory paralysis the usual physical signs associated with lobar or bronchopneumonia were absent. The respiratory type usually was fatal. Paralysis involving the muscles of the back, as the serratus magnus occasionally were seen. Many cases of lumbar paralysis, and paralysis of the sternocleidomastoid with deltoid paralysis were seen. Abdominal paralysis with a flaccid condition of the abdominal muscles, with distinct absence of the abdominal reflexes, was occasionally seen.

The abortive type of cases is apparently responsible for the spread of the disease for the majority, owing to the mildness of their symptoms are passed unnoticed. In this type of case the temperature may rise no higher than 101 and last but one or two days. The child will be apathetic complain of headache, and have extreme lassitude, and may also complain of pain in the arms and legs. In some forms of the abortive type the symptoms will pass after one day and the child will regain his appetite, and be as bright as usual. The reflexes may be slightly exaggerated but there are no other evidences of paralysis.

During the last epidemic Fischer noted the following condition several times. A child would be taken ill with fever vomiting have a marked acetone odor to the breath and show all the evidences of an acute gastric fever. The urine would contain indican, and at times acetone and diacetic acid. The child would recover after a mild laxative and a strict diet. About four or five days later a second child in the same family would have a similar attack of fever vomiting and show gastric derangement and suddenly have paralysis of the arms, legs or other parts of the body. The deduction to be drawn from the clinical picture just given is that the first case was evidently one of the abortive type.

Treatment was begun with gastro-intestinal cleansing mild salines to cleanse the bowels and high colon flushings to relieve coprostasis. Liquid diet consisting mainly of milk and fermented milk formed the basis of the diet for the first week. Fruit juices and water were given for thirst. Vegetables cereals and wheat bread were given for their phosphatic content.

Where extreme prostration existed and the child dren were listless, 150 to 250 ccm. of warm saline solution were given by hypodermoclysis in the loose cellular tissue of the abdomen.

Lumbar puncture was done to relieve intracranial pressure. In many cases this procedure alone afforded relief by inducing quiet sleep.

Urotropine was given in 5 grain doses, three times a day. Older children received 10 grains three times a day. Adrenalin was used both intraspinally and subcutaneously but results showed no specific benefit therefrom. Rest in bed was enforced, and the weight of the bedclothes kept off the affected limbs.

Convalescent and immune sera were injected intraspinally in doses of from 10 to 5 centimeters. Slight febrile reactions usually followed these injections. In the cases reported from the Willard Parker Hospital serum was injected after paralysis had taken place as the cases were not sent to the hospital until after they had become paralyzed.

Drop-foot and drop-wrist were supported with plaster casts as early as the first or second week following the paralysis. Excellent results are reported from artificial support given to the weakened muscles. Where the muscles of the back were involved, a Bradford frame gave excellent support. Hot baths aided by general faradization and massage stimulated the circulation.

Below B. Experimental Measurements of the Foot as an Aid to a Better Diagnosis and More Rational Treatment. *J. M. St. M. Ass.* 97: 3

The method used in this investigation was to make an X-ray negative of the foot at rest, placed in position at right angles to the leg and the inner side of the foot next to the plate, the rays were passed straight through the foot from side to side. Another negative was then made in a similar manner but with the patient bearing his full weight upon the foot. A study was made of the differences in measurements on the two plates, taking the distances from selected points on the various tarsal and metatarsal bones to a base line.

Below considers it a distinct aid in the study of a given foot but it should not supplant the physical examination, cast impression, etc. Certain conditions of the bones of the feet overlooked by other methods of diagnosis may be ascertained by the measurements advocated and more intelligent treatment instituted. R. B. CONNOR.

SURGERY OF THE SPINAL COLUMN AND CORD

Rugh, J. T.: Atlo-Axoid Disease. *Am. J. Orth. Surg.* 97: 255

The author reports two cases of tuberculosis of the atlas and axis which is not a frequent location for this disease. The process usually begins in the synovial parts and gradually extends to the bony structures. The entire vertebrae may be involved or the disease may be confined to but one or two portions. If the odontoid process of the axis is involved it may crumble and be absorbed or it may be broken off and if pressure occurs on the cord paralysis or sudden death may result. The occiput may be involved either primarily or secondarily.

The symptoms are stiffness of the neck, fixed backward tilting of the head, pain radiating from the atlo-axoid region downward along the spinal nerves and frequently of a burning character without any intermission. Abscesses may form early and usually locate in the retropharynx or in the suboccipital triangle, though in one of the author's cases it made its appearance in the lumbar region. Muscular atrophy is usually present early. Paralysis may be present due to pressure. The head usually tilts to the affected side if there is unilateral involvement. The head is supported by the hands to relieve pressure and prevent pain. There is usually a slight elevation of temperature. Faring is unbearable. There is practically no deformity of the spine. Roentgenograms taken at different angles and with the mouth open are very valuable.

The author recommends as treatment the usual

treatment for spondylitis, viz., a calot jacket including the head or a brace with head support or celluloid jacket enclosing the head and trunk. Bed treatment in a wire collar or fixation frame may be satisfactory. He believes however that the bone-graft offers more complete and permanent fixation, with earlier cure. The graft reaches from a hole dug in the occiput to the split spines of the third and fourth cervical vertebrae. Plaster-of-Paris fixation is necessary with the patient in bed for six or eight weeks. The cast is changed every six or eight weeks and finally removed in from eight to ten months. PHILIP LEWIS

Sharpe, N.: The Treatment of Fracture of the Spine. *Am. J. M. Sc.* 96: 335

In a clear and interesting discussion of the subject the author makes a strong argument for early operation in injury of the spinal column with involvement of the cord whether trivial or serious. He argues that although actual damage by bony pressure may already have occurred great additional nerve destruction may occur from hemorrhage and edema. A laminectomy performed as soon as the immediate shock of the accident has subsided, with opening of the dura thus removing all pressure at the time or subsequently upon the cord, will prevent further injury and give the best possible chance for recovery.

The symptoms, mechanical conditions, and pathology are well covered. The author points out that in partial lesion of the cord, destroyed, damaged, and

sound fibers are found side by side and that if all compression is quickly removed not only will the sound fibers be preserved but functional and even anatomical repair will take place in many of the damaged but not destroyed fibers. Inasmuch as the cord fibers, if damaged and compressed may degenerate in four days, the author disagrees wholly with those who would postpone operation until "blood-clot is absorbed."

From the point of view of symptoms he divides the cases into those with partial abolition of function and those with immediate and complete abolition. The treatment of both classes is however the same. The object of the operation is sufficient removal of bone to afford ample room for the cord and free opening of the dura for removal and drainage of blood. The dura may be reclosed or not as indicated by the condition of the cord. As regards suture of completely divided cord although the function cannot be restored great improvement following suture in the sensory and trophic disturbances thus avoiding terrible bed-sores warrants suture.

The author states that of five cases of suture reported four were living several years after the operation while without suture no patient has lived one year. In cases where suture is attempted if the ends cannot be approximated and the lesion is in the dorsolumbar region, an attempt should be made to unite the roots above and below the lesions.

Ten cases are reported which well illustrate the points of the argument. HORACE BROWNE

Jones, E.: The Treatment of Vertebral Tuberculosis. *Calif St J Med* 1917 xv 50

The author bases his report upon an experience gained from thirty three cases of bone transplantation for spinal tuberculosis, the patients ranging in age from three years to forty-eight. Cases operated upon within the last six months are omitted. The Albee technique was rigidly adhered to in every case except one where the transplant was grafted laterally into the bases of the spinous processes. The post operative treatment in adult cases was discontinued at the end of six weeks, except in two cases in which braces were temporarily applied. In the children the postoperative routine was six months of recumbency and heliotherapy. Of the total number of cases 17 occurred in children. The disease had existed for six months to twelve years previous to operation. The kyphoses were in all stages of prominence. The location of the disease was dorsal in 31, dorsolumbar in 4, and lumbar in 8. The largest number of vertebrae involved was 6. The per cent of successful results was 96. There was no mortality incident to the operation.

The author believes that because of the small size of the spinous processes in children union is slower and less certain than in adults and that therefore recumbency for a greater length of time is essential.

Infection which occurred in a small number of

cases had no deleterious effect upon the final results of the operation.

The early relief from pain, the sense of security and the rapid recovery from the disease after the operation commend this procedure. R. B. CORNELL

Beckman E. H.: Tumors of the Spinal Cord. Report of Eighteen Cases. *J Lancet* 1917 xxxvii 35

Eighteen operations for spinal cord tumors form the basis for the author's comments. These tumors are divided into extradural intradural (extramedullary) intramedullary angiomas and cysts. In addition to the last two varieties there are included fibromata, tuberculomata, sarcomata, gliomata, and psammomata. Of the series 14 involved the thoracic region, 2 the cervical and 2 the lumbar. The duration of symptoms is noteworthy. It varied from nine months to seventeen years.

Beckman believes that many tumors of the spinal cord are overlooked because the average physician is not familiar with the methods of neurologic diagnosis. In order to obtain better results with fewer cases of permanent paralysis, it is necessary that these tumors be diagnosed early and operated on during the early stages. Obviously pressure maintained on the spinal cord for a considerable length of time produces a degenerative process in the delicate cord structures from which there is no regeneration. He believes that in many instances in which the diagnosis of cord tumor is not absolute but in which there are level symptoms laminectomy should be advised. Root pains are a common symptom in most cord tumors. In some instances the pain may be so slight or the predominance of other symptoms at a later period may so overshadow the previous pain that it is entirely forgotten by the patient and can be obtained only by the most careful questioning. Level symptoms are always present in the later stages, although tactile pain and temperature sense may not be involved to the same degree. In some instances one of these may be absent and the tumor may then be located by the definite level of the others.

Beckman urges a more careful examination in neurologic conditions and a more frequent and earlier laminectomy in cases of suspected tumors as the only method of preventing crippling due to long-standing pressure of tumors on the cord.

A case is reported in which a gall bladder operation was performed for unilateral root pains confined to the region of the gall bladder and associated with spells of vomiting.

The mortality following laminectomy for spinal cord disease should be well under 10 per cent. In a series of 43 consecutive operations for spinal-cord disease exclusive of traumatic cases there were four deaths, one of which might be classified as accidental, the patient having died on the eleventh day of pulmonary embolism. Certainly a patient whose chance for recovery is slight with any other form of

treatment should not be denied the privilege of an exploratory laminectomy.

A few cases of localized syringomyelia with a single cyst or collection of fluid in the central canal of the cord have been entirely relieved of symptoms

when the cyst was evacuated. As to aneurysms of the cord some of the patients were entirely relieved when the pressure was removed on opening the dura, in other instances relief was obtained by ligation of some of the large vessels. P. G. SCHLAFER, JR.

SURGERY OF THE NERVOUS SYSTEM

Auvray M. *Shrapnel Bullet Movable in the Interior of Rachidian Canal Extracted from the Midst of the Nerves of the Cauda Equina* (Balle de shrapnel mobile à l'intérieur du canal rachidien, extrait, milieu des nerfs de la queue du cheval). *Bull. Acad. de méd. Par.* 9 6 Lxxvii, 44.

The observation reported by Auvray is one of the rare cases where a projectile lodged in the interior of the rachidian canal, is small enough to make its location precise and its extraction rather delicate matter. The patient was wounded in August, 1914, his wound characterized by urinary and fecal retention. Radiographic examination later showed a round shrapnel bullet situated a little to the right of the median line of the vertebral column in the lumbar region between the spinous apophyses of the fifth lumbar vertebra and the sacrum. The radiograph suggested that the projectile was somewhat superficial. For extraction the skin was excised for about 2 cm. over the lumbar spinous apophyses. The sacrolumbar muscles on the right side were stripped. In the course of this procedure on reaching the spinous apophyses of the fifth lumbar an abundant flow of cerebrospinal fluid suddenly ran out which evidently escaped by an orifice from the dural sac produced by the passage of the projectile and which further was evidence that the projectile had penetrated the interior of the rachidian canal.

Auvray therefore stripped the sacrolumbar muscles of the left side and resected till the lower lumbar spinous apophyses were exposed. The orifice of the dural perforation was enlarged by an upward incision in order to explore the interior of the canal. The edges of the dural incision were well separated and after some trials made with a cannulated sound a metallic body was felt which easily became displaced upward. After escaping several times it was finally seized and extracted. After the extraction attempts to suture the dura mater orifice succeeded only to the extent of narrowing without effacing it. The wound was closed by muscular and skin suture without drainage. The patient had lost a very considerable quantity of cerebrospinal fluid and this continued through a fistula. The patient left the hospital in March 1915, and since then he has had trouble in his lower limbs, also urinary trouble with persistent constipation.

In November 1916 his recovery was almost complete. It has taken almost two years for the disappearance of the nerve troubles brought about by the lesion of the nerves of the cauda equina from the midst of which the projectile had been extracted.

The author refers shortly to the few similar cases reported in the literature. In such cases the mobility of the projectile in the interior of the canal has been very manifest and as a consequence localization and extraction have been difficult. W. A. BRIDGES.

Flacher H.: *Gunshot Injuries of the Peripheral Nerves and Their Treatment*. *Ann. Surg. Phila.* 9 7 Lxv 56.

Gunshot wounds of the peripheral nerves show a varied picture depending upon the angle at which the bullet strikes the nerve. The greatest amount of destruction of nerve substance occurs in those cases in which the bullet strikes at an acute angle to the long axis of the nerve. In the present war owing to the small caliber and the great velocity of the modern army rifle bullet, perforation of large nerves is not rare. In certain cases the nerve is not injured at all while in others, very fine particles may become embedded in the substance of the nerve giving rise to palsy and frequently unbearable nerve pain. Secondary paralysis may develop from the healing of the wound, the nerve having escaped the bullet. The nerves most frequently affected are, in order of frequency the radial, the ulnar, the median, the peroneal, the sciatic, and the brachial plexus.

Various surgeons differ as to the time of operation. Foerster of Breslau advocates waiting four to six months providing there is any question as to the amount of actual injury. If one is reasonably certain that there is a complete division of the nerve, primary suture will give the best results, though if there is doubt as to the complete separation, it may be well to wait a few weeks.

When a nerve is severed, it will be seen that after a few hours, the divided axis cylinder will pour out a peculiar fluid substance in the form of droplets. In an endeavor to reach the peripheral end, fine threads grow out which immediately meet the resistance of coagulated blood and young connective tissue cells interposed between the divided ends, and they are deflected back toward the brain, or

deviate laterally, producing the familiar neuroma. To obviate this difficulty tubulization neuroplasty and nerve-grafting have been devised. For tubulization Kirk and Lewis have suggested the use of fascia, but this has been objected to on the ground that a nerve will not grow into an empty space and that the fascia may form scar tissue.

As a result of Edinger's experiments with nerve growth in agar Ludloff used calves' arteries filled with agar and with this method he reports surprisingly good results in 14 cases. In all of these cases certain phenomena of regeneration were present in two to three weeks. The improvement continues for some weeks, but then follows a period of slow progress caused by the slower recuperation of the muscles and joints. The author believes that the best tissues with which to envelop the site of a nerve-suture in order to avoid a new perineural scar are calves' arteries (prepared with formalin after Foranitti) and fat. Neuroplasty is done by bringing down a flap to form the central stump after the method of tendon lengthening. It has found little favor with surgeons and is probably useless.

Von Hofmeister has proposed nerve grafting especially in cases in which there are large defects. He implants the central stump of the resected nerve into a normal nerve running parallel to it and the distal stump a little further down into the same nerve. Encouraging results have been reported but time is still too short to judge the method by definite cures.

In fresh, uninfected wounds with injuries of nerves careful immediate suture should be done. Some surgeons warn against silk on account of its tendency to cause intraneural scar formation. On the other hand catgut is not so firm and is quickly absorbed. The suture should go only through the perineurium. In almost all cases seen under the present conditions of warfare more or less extra and intraneural scar tissue is present. This intraneural scar tissue envelops the individual nerve fibers and compresses them and its removal is necessary to the re-establishment of conductivity.

The author reports seven cases which he operated upon while working in Germany in 1915 and 1916. GATEWOOD

MISCELLANEOUS

CLINICAL ENTITIES—TUMORS ULCERS, ABSCESSSES ETC.

Bainbridge, W. S. The Cancer Problem and the World War; a Brief Résumé of What Has Been Accomplished in America During the Past Two Years. *Med Rec* 1917 xci 47

The exigencies of war having practically stopped cancer research for the time being in the European laboratories, the responsibility for the continuation of the various lines of experimental investigation has been thrown largely upon the research institutions of this country. It may be timely therefore to look backward and to briefly review the progress along certain lines of research which bear most intimately upon the clinical or practical aspects of the cancer problem viz. those which involve (1) the etiology, (2) the early diagnosis (3) the prevention (4) the treatment. From such a review the following deductions of a practical nature can be drawn.

1. None of the investigations regarding the etiology have revealed anything concerning the cause of cancer which need give rise to a radical change in the generally accepted views with regard to the treatment of the disease.

2. The laboratory investigations with regard to heredity should be continued, but it is deplorable that, in this stage of knowledge, this possible factor in etiology should be brought to bear in the effort to control cancer in the human subject. The advo-

cacy on the basis of these findings of the eugenic control of matings has already given rise to vastly more mental suffering than is warranted by the facts in hand.

3. Whatever part soil and diet and other allied factors may play in the cause of cancer the findings so far published do not warrant the application of deductions therefrom to the diet plus régime method of treating cancer if this is to exclude the early and radical removal by surgical means, of the cancer.

4. The findings with reference to the causative effects of prolonged irritation reinforce the view that it is important wherever possible, to eliminate this factor by rational means.

The clinician has been given no reliable aid to diagnosis in the early stages of cancer by the continued researches with regard to the various tests or reactions.

The education of the medical profession with reference to the earlier diagnosis of precancerous and early malignant lesions of the layman in avoidance of the sources of chronic irritation together with co-operation between physician and layman are emphasized by continued investigation. No definite means of preventing cancer has been developed.

As regards the treatment of cancer nothing has been developed which detracts from the rôle of surgery. Diet hygienic régime, and all adjuvant measures should be given their proper place as aids merely. It is to be hoped that the painstaking

research and clinical observation of those who are devoting so much attention to the means of conquering this malady will result in finding the essential etiology and offer sure prevention and a better cure.

E. K. ARMSTRONG

Gayford H. R. The Clinical Course of Cancer in the Light of Cancer Research. *Surg. G. Acc. & Obs.* 9:7 11 94

Gayford believes that the time has come when some of the advances of cancer research should become the possession of the clinician and should be a part of his reasoning and guide him in the consideration of clinical cases. He points out that there are many ways in which the classical clinical picture of cancer should be modified by the discoveries in this field in the last two decades and refers particularly to the immunity of cancer. Our knowledge of which subject he states has been gained by experimental studies with the smaller animals.

It is known that when the disease is transplanted, there is aroused in the organism of the affected individual a resistance. This resistance is greatest in the earlier stages of the disease. It is the force which holds the disease dormant or by its loss permits its progress, and in some instances it is the force which succeeds in overcoming the disease and producing those rare occurrences of spontaneous recovery which as the author states have been observed experimentally and naturally in animals and occasionally in human beings.

He refers to the fact that it has been observed that mice inoculated with mouse cancer would sometimes develop tumors even of considerable size, that the tumors would then retrograde and disappear leaving the animal immune to further inoculations a fact which has been repeatedly observed in various types of tumors in lower animals in all the laboratories of the world engaged in cancer research. It was also found that the chance of spontaneous recovery in inoculated animals was inversely proportional to the duration of the disease and the size of the growth meaning that the chances of recovery are greatest in the very beginning of the disease. Gayford points out the great importance of this observation to the surgeon for the reason that he is constantly endeavoring to secure cancer cases early and it explains why surgical interference in the very beginning of the disease is so much more successful than late. He was able to collect authentic cases from the literature which showed that in the earliest stages of the disease, even when all the growth was not removed by the surgeon in some instances what was left retrograded and the immune forces were sufficient on the removal of the greater portion of the growth, to overcome the rest.

Another important observation which he calls attention to is the fact that operations upon inoculated tumors accelerated the rate of growth of metastases or of secondary implants, particularly where anesthesia had been used and where the operation had

been attended by some loss of blood. This he points out has a practical bearing for the surgeon who encountering a favorable-looking cancer case in which the growth has progressed but slowly performs a radical operation with anesthesia, when suddenly the growth recurs and grows at a greatly accelerated rate terminating rapidly in death. Every surgeon he says, has had the experience of seeing cases which he regretted having operated upon, in that the operation did not prevent recurrence and after prompt recurrence the progress of the disease was greatly accelerated.

Reasoning from the experimental demonstration of these forces in inoculated animals to the existence of such forces in animals spontaneously suffering from cancer and to the phenomena observed in the clinical course of cancer in human beings, we have before us the author states, the logical explanation of many vagaries and ill-defined phenomena in cancer in man. It is understood now why surgical interference is so successful in the very first stages of cancer and why it is so unsatisfactory in the later stages. The author advises against tedious and long-drawn-out operations, using chloroform or ether as an anesthetic and associated with marked loss of blood and speaks of certain evidences which can be offered to show that X-ray and radium exercise their curative effects through the immunity.

Gayford believes that the outlook of cancer research and the prospects of practical help for the clinician are many times brighter today than they were eighteen years ago when experimental cancer research may be said to have been founded.

GEORGE E. BRILL.

Bullock, F. D., and Rohdenburg, G. L.: Spontaneous Tumors of the Rat. *J. Cancer Research.* 9:39

In the following table the authors summarize 123 cases of tumor of the rat which they have been able to gather from the literature.

Benign tumors—

Fibroma
Breast
Liver
Larynx
Subcutaneous
Appendix
Liver
Fibrosarcoma
Breast
Uterus
Kidney
Papilloma
Bladder
Kidney

Malignant tumors—

Sarcoma
Sarcomatous
Liver
Thyroid gland
Secondary gland
Bone
Mesentery
Adrenal gland
Carcinoma
Breast
Lymphatic vessels
Kidney
Bladder

Epithelioma
Tongue
Vagina
Endothelioma
Pentostemon

From December 1913, to October 1915 there were received in their laboratory approximately 15,000 rats, the vast majority of which were comparatively young animals from three to eight months old. The authors discovered 32 tumors which they classified as follows:

| | |
|-----------------------|---|
| Benign tumors— | |
| Fibroma | |
| Subcutaneous | |
| Adenofibroma | |
| Breast | 1 |
| Adenoma | |
| Kidney | |
| Thyroid | |
| Cystadenoma | |
| Thyroid | 1 |
| Papillary cystadenoma | |
| Thyroid | 1 |
| Malignant tumors— | |
| Carcinoma | |
| Breast | |
| Sarcoma | |
| Liver | 4 |

From their study of this subject the authors draw the following conclusions:

The incidence of spontaneous tumors in white rats is higher than in wild rats partly due they believe to the greater longevity of the white rat. Sarcoma of the liver they found much more common in white rats than in wild rats probably because the former animals are kept in close confinement and thus readily infected with the *tenia crassicolis*. The cysticercus stage of this parasite (*cysticercus fasciolaris*) they state is directly associated with hepatic sarcoma in 90 per cent of the cases acting however merely as a chronic irritant.

There is no evidence in their observations to support the assumption that substances derived from the dead parasite are more efficacious in the production of tumors than the excretions of the living *cysticercus fasciolaris*. Epithelial tumors they state, are much more frequent in rats than is generally supposed.

Since the author's paper went to press up to December 30 1916 sixteen additional spontaneous tumors developed in the laboratory stock which were classified as follows:

| | |
|----------------------|---|
| Adenofibroma breast | |
| Sarcoma liver | 1 |
| Sarcoma peritoneum | |
| Carcinoma kidney | |
| Epithelioma head | |
| Myeloma lymph-glands | |

All of the sarcomata of the liver which the authors studied originated in the walls of parasitic cysts. In two of the cysts showing early sarcomatous transformation the *cysticercus fasciolaris* was alive while in the remaining four animals the parasite was dead.

GEORGE E. BRIDGER

Bolognesi G: Primary Tumors of the Aponeuroses (Les tumeurs primitives des aponeuroses)
Rev d'chi 1916 xxxv 876

Little is found in textbooks of surgery or pathological anatomy concerning tumors of the aponeu-

rosis i.e. the fibrous membranes enveloping the muscles. The mere mention being made of the possibility of the development of primary conjunctival tumors in the form of fibromata or sarcomata of the aponeurotic membranes. Most authors treat only of muscle tumors tumors of the tendons, or tumors having an origin which is rather vaguely described in the clinical descriptions, but having their origin in the cellulo-musculo-conjunctival parts.

The author reviews the literature pertaining to tumors having their origin in the aponeurotic membrane, and gives the details of three personal observations. Comparing these with the observations reported by others he arrives at these conclusions:

1 Although primary aponeurotic tumors are infrequent it is not improbable that clinical observations of such primary tumors are less rare than is inferred in medical literature.

2 Regarding the particular aponeuroses those of the lower limbs are found to be most frequently those attached by neoplastic processes — the three cases cited by the author being of this class.

3 Neoplasms of all kinds may be found, even of a mixed type. In the author's cases one was a fibroma and one a sarcoma.

4 Regarding the clinical characteristics of these tumors there is nothing very particular to be pointed out. The diagnosis of the situation differentiating them from the neighboring soft tissues of the aponeurotic membranes is not clinically possible in the majority of cases. In none of the author's cases was it possible to establish an exact diagnosis of the situation of the neoplastic tumefaction. The clinical diagnosis in these three cases were muscular osteoma, subcutaneous sarcoma and fibroma of the iliac fossa respectively the precise nature of the neoplasm being verified only after extirpation.

W. A. BRENNAN

Goen A. F.: A Study of Some Diagnostic Reactions for Malignant Tumors. *J Cancer Research* 1917 ii 61

Under the auspices of the Huntington Fund for Cancer Research the author has investigated some of the serum-diagnostic tests for malignant tumor chiefly those of Freund and Kaminer and of von Dungern and in this communication he reports the results of that study.

He points out that in the search for a diagnostic serological test for malignant tumors, the investigations have generally followed the lead of the specific as well as of the non-specific immunity reactions but some tests have been devised that are not based on any of these reactions.

The experimental basis of the search for a specific immunity reaction in cancer is found chiefly in the studies upon immunization against normal tissues. These have demonstrated antibody production against tissues derived from foreign species, against the cells of animals of the same species and against the cells of certain of the individual's own

organs (kidney, pancreas, and spleen). Ample ground seemed to the author to be furnished by the results just cited for the assumption that the immunity often observed against the inoculation of homogenic transplantable tumors was due to the influence of cytotoxic antibodies yet such antibodies have never been found. Moreover, the author states, the methods of specific precipitation and complement fixation, also have generally failed to reveal the development of antibodies in animals bearing true transplantable tumors.

In human cancer specific antibodies have been sought with the use of the method of complement fixation, the anaphylactic reaction and the sensitization reaction. The method first mentioned has failed completely in number of hands. Liddle, however, believed that he could show, with the serum of two cases of human carcinoma, a slight specific complement deviation, and Simon and Thomas using the hemolytic system, hen corpuscles, antihem corpuscles — rabbit serum and guinea pig complement — obtained complement deviation in 14 out of 37 cases of malignant tumor by mixing the patient's sera with quantity of cancer extract that by itself was not anticomplementary. They obtained no positive reaction in 50 cases of normal or otherwise diseased individuals.

The next series of tests was carried out by the author with the object of studying the nature of the cytolytic agent in normal. For these experiments fresh normal human sera and horse serum were used, the other reagents being the same as in the first experiment. However, in these tests no cytolytic took place.

It is evident from the author's experiences with the Freund-Kamine phenomenon, that the cytolytic action of normal sera is dependent upon some factor as yet uncontrollable and that that action, therefore, cannot be made the basis of a differential test for malignant tumor.

His experiences with the complement fixation test for cancer seem to him to point to the possibility that the positive results that have been reported are due in part to accident and in part to summation effect or as Sachs has suggested that a hitherto unknown and uncontrolled factor is required for the successful application of the method.

GEORGE E. BRIDLEY

Stys, M., Holmes, H. F., and Walls, H. G.: Primary Spontaneous Sarcoma in Mice. *J. Cancer Research*. 1917, 11.

Among 12,000 mice dying in the laboratory of the Department of Pathology of the University of Chicago and subjected to careful autopsy the authors found 87 with neoplasms which they diagnosed as sarcoma, an incidence of about 7.35 per thousand, including animals of all ages and dying from whatever cause, whether accidental or natural. They recognize fully the difficulties that attend the differentiation of sarcoma, and for the purpose of this study they excluded every form of new growth con-

cerning the nature of which there seemed any possible room for question. Therefore they have not included numerous cases in which the growths were probably sarcomatous, and many more in which they were not sure that the neoplasm was not sarcoma.

The authors recognize that as with human tumors, mouse sarcomata frequently arise at the site of a trauma, and this has been observed in 11 of their series. It is evident to them that they have no knowledge of how many of the other mice had received injuries at the point at which they subsequently developed a sarcoma for the life of a mouse is beset with many accidents and deeds of violence. Especially among the males wounds are often received fighting.

In the cases in which the relation was clear to the authors the injury was noted and afterward the sarcoma made its appearance at this point, or else clearly it was observed at the site of a scar from some old injury. A particularly good example they quote as Case 3117 previously described under the heading of multiple primary sarcoma. This mouse was bitten on the back and genitals and so severely wounded that it was taken to the hospital to recover. There, while under observation, two typical spindle-cell sarcomata arose at the site of these wounds.

The influence of heredity in determining the occurrence of sarcoma in the site of old wounds has been especially noted by the authors in this series, and found to be important. This is a large subject, however, and as they state will constitute by itself a separate paper, hence, they do not discuss it in the present one. Also the relation of age to tumor formation requires they state, more detailed study than they have yet been able to give it, and is reserved for future consideration. They have observed no relation of the sarcomata to any particular form of infection or inflammation, nor have they observed any parasites in or about the sarcoma in single instance. This is particularly interesting in view of the relation of liver parasites to sarcoma of the liver in rats. Their mice often had tapeworms filling up the bile-ducts and leading to extensive abscesses of the liver but they have never observed either sarcoma or liver adenoma arising in these lesions. There seems to the authors to be no relation between these sarcomata and the leukemias at least in this series they had only two cases in which sarcoma coexisted with leukemia and none with pseudoleukemias. The tendency to the coexistence of tumors they consider, however quite marked, as with all other types of spontaneous mouse tumors yet studied, and this they believe may be interpreted as the existence of a high natural susceptibility to the formation of neoplasms in the affected animals. It is certain they state that the more highly cancerous the ancestry of mice the more likely they are to have multiple independent spontaneous tumors.

In a series of 12,000 autopsies on the bodies of

mice dying at all ages either from natural causes or in a relatively small proportion from accident there were found 87 mice with neoplasms meeting all the criteria of sarcoma. These do not include any growths of the character of lymphosarcoma because of the recognized uncertainty of the nature and diagnosis of these neoplasms also they have excluded 11 cases of characteristic mediastinal tumors arising at the site of the thymus and infiltrating the lungs. Tumors of the testicle, adrenal, ovaries and kidneys of mesothelioma character are also omitted.

Spindle-cell sarcoma constituted over half the tumors, there being 47 of all types not including 3 oval-cell sarcoma, 3 perivascular sarcoma, and 2 alveolar sarcoma. There were 12 osteoid sarcoma, and 10 polymorphous-cell and 10 round cell sarcoma. Metastasis was observed in 23 of their cases or 26.4 per cent the osteoid sarcoma leading with 75 per cent metastasis occurred in only 13 per cent of the spindle-cell sarcoma. Lungs, liver and lymph glands showed most of the metastases. In all respects, the authors state, these sarcoma of mice corresponded with the sarcoma of men although they found no examples of melanosarcoma, multiple myeloma, or myeloid sarcoma. In at least 11 cases the sarcoma definitely arose at the site of previous injuries. In a few instances there seemed to be two distinct primary sarcoma in the same mouse and there were three instances in which the growths suggested a mixture of sarcomatous and carcinomatous elements. About half the sarcoma arose in the subcutaneous tissues, apparently from the mammary gland in most cases they believe and next in frequency from the osseous tissues. Two cases of sarcoma of the uterus were observed the only uterine tumors of any kind observed in all the autopsies. Twenty of the sarcoma mice also had other independent tumors, lung tumors being most numerous. Two mammary gland tumors were found closely resembling in structure the embryonal adenocarcinoma of the kidney of man and other animals but without renal involvement. The influence of inheritance on the incidence of sarcoma has been found to be marked but is reserved by the authors for further discussion.

GEORGE E. BEVLEY

SERA, VACCINES, AND FERMENTS

Dean H. R.: *The Mechanism of the Serum Reactions.* *Lancet* Lond. 19 7 cxvii, 45

In discussing the merits of rival theories of the mechanism of the serum reactions, it has been frequently observed that Ehrlich's hypothesis alone provides an explanation of the problem of specificity. The value of the side-chain theory as an explanation of specificity may however be doubted. To say that antigen unites with antibody as a key fits a lock is no explanation at all. It is merely a diagrammatic representation of the supposed facts. Of the nature of the fundamental reaction between antigen

and antibody we have no knowledge at the present time. But, in all the serum reactions which have been considered, the immediate consequence is an aggregation of globulin particles around the antigen. The degree to which the aggregation or precipitation proceeds depends entirely on the experimental conditions on the relative proportions of antigen and antibody in the mixture on the nature of the antigen containing substance, red corpuscle bacillus, or normal serum on the presence of some third factor a normal serum containing complement or conglutinin. In other words, the various serum reactions are various methods of observing and measuring one single reaction. The simplest of these reactions is the precipitation reaction, for in it the formation of the precipitate is directly observed. In the other reactions the aggregation of particles may be less complete and the change is measured by indirect methods.

The main phenomena are most readily accounted for by Bordet's absorption theory and no useful purpose would seem to be served by postulating the existence of a separate kind of antibody for each of these reactions. The reactions are, no doubt, of a very complex nature as all reactions which occur in a mixture of colloids must be and it is to be anticipated that great difficulties must be encountered before any entirely satisfactory explanation is arrived at. Similar difficulties have been met with in the past whenever the attempt has been made to explain physiological phenomena in the light of the laws of chemistry and physics. These difficulties will in time be met and with a more perfect knowledge of the mechanism of the serum reactions there will be attained a more perfect knowledge of the laws which govern both natural and acquired immunity.

EDWARD L. CORNELL

BLOOD

Oliver H. R.: *Use of Whole Blood in Hemorrhage.* *Calif. St. J. Med.* 1917 xv 13

It was the original intention to deal with only the intramuscular injection of whole human blood. But it was found necessary to consider the different hemorrhagic diseases, to consider the cause of coagulation and the different theories advanced and the treatment by means of corrective sera or serum products.

Almost every form of serum has been used and from all good results have been reported. Among the sera used are rabbit horse, antitoxic, normal human, citrated blood, pipetted blood and whole human blood.

The injection of animal sera on account of the difference of species by reason of the metameric protoid content are capable of sensitizing with the cardinal symptoms of anaphylaxis. The homologous sera do not, and rather tend to be of distinct nutritive value especially in malnutrition of infants.

Normal serum takes time to separate out and soon becomes inactive by the formation of meta

thrombus. Fresh rabbit serum is the best of the animal sera but the same objection arises. However, it is less toxic than horse serum and does not sensitize so quickly.

To overcome the above fault it has been demonstrated that the most efficient method is to obtain 20 ccm. of blood from the veins of a healthy person by means of a large L. E. syringe and to inject it immediately into the gluteal muscle of the patient. It is not painful as the blood soon diffuses, and it leaves no bad results. It is so simple and the results so striking as to merit attention.

The author has used it in six cases of melena neonatorum with an injection only procuring perfect relief and cure. He has used it in other conditions of hemorrhage, as in duodenal ulcer in several instances after the failure of lactose, horse serum, etc., with complete cessation of the hemorrhage and rapid recovery. Also in hemorrhage with purpura in tuberculosis pulmonalis with the best results. He recommends its use in all cases of this nature.

BLOOD AND LYMPH VESSELS

Haythorn, S. R. and Ryan, A. H. Aortic Aneurism In Dogs. The Report of Six Cases. *J Med Research*, 9, xxiv, 4.

Somewhat over a year ago Ryan accidentally came across the first of the aneurisms in the aorta of a dog which was being used in connection with the work of the department of Physiology of the University of Alabama Medical School at Mobile. Following this finding careful examination was made of every dog which died in the department with the result that five more well-developed cases were found. A seventh case was mistaken for an aneurism until it was opened, when it was seen that the dilatation of the lumen was very slight and that the apparent enlargement was due simply to nodular growth in the adventitia. A search through the literature by the authors has revealed only four reported instances of aortic aneurisms in dogs.

Sections taken from portions of various aneurismal walls showed an almost constant picture. The intima was invariably thickened sometimes equaling almost one third of the entire thickness of the wall. The thickening appeared to be due to a new formation of connective tissue of a more or less scar-tissue type. Proliferation of the superficial endothelial lining was not noted and stains for fat with Sudan III gave negative results. The media showed great destruction of the elastic layers the fibers being broken into short lengths separated from each other and frayed out at the ends. The internal elastic lamina was often split into two more layers. Both in the parallel spaces between the elastic layers and in the spaces between the broken ends of the fibers there was much replacement fibrosis. Many new-formed vessels, mostly capillaries but in some instances vessels presenting definite walls, were found penetrating deeply into the media and occasionally extending almost through to the intima.

They appeared to have come in by extension and proliferation of the small vessels in the adventitial coats, the author states. There was constantly found a profuse lymphocyte and plasma-cell infiltration along their courses. The destruction of the elastic tissues was always more pronounced along the courses of the small vessels, and a great many of these areas were directly related to nodular scars in the adventitia. The portions of the adventitia between the nodules showed some fibrous thickening but usually nothing remarkable.

The nodules were of two types those which were more acute and either contained worms or the evidences of having recently contained worms, and those which were merely nodules of stellate scar tissue.

The former types were found only in the first four cases which the authors studied the latter type in all of the cases of aneurism but not in the aorta where only the single nodule was present. The acute type of nodule was located largely in the adventitial coats with necrotic foci and areas of granulation tissue reaching into the medial layer. This granulation tissue was not distinctive but was made up of new vessels and fibroblasts of varying ages.

The form of worm present was not always the same. In one very large well-developed nodule the authors found a fair-sized female spirocercus, but in the majority of the nodules the gender of the worm could not be determined. Only one worm was found in each of the other nodules in their cases which was in contradistinction to the esophageal cyst and lymph node cysts, where three or more worms were constantly found curled up together. The worm free nodules from both groups of cases were similar in appearance and of fairly characteristic structure. No microscopic evidences of worms or ova were found, and the nodules were composed of more or less well-developed scar tissue masses gathered about somewhat stellate clefts.

In view of the fact that little has been written on aneurisms in dogs, the authors consider it remarkable that the condition should be so prevalent in the locality and they believe that if six cases can be found in about one year's time it is safe to conclude that a large percentage of the dogs in Mobile are infected with *spirocercus sanguinolentus* and that many of them have aneurisms. It is also rather remarkable, they believe, that so little about the occurrence of this parasite in America should be available in the literature.

From their studies the authors reached the following conclusions. The dogs in certain localities of the United States are infected with an ovigerous nematode, *spirocercus sanguinolentus* which worm is prone to attack the walls of the aorta and cause a type of medial disease which leads to the development of aneurisms.

Successful inoculation of dogs with this parasite, the authors believe would afford an excellent method of studying experimental aneurisms. Un-

recognized spleroecia lesions of the healed type they think, might give rise to very erroneous conclusions if they occurred accidentally in dogs used in the experimental production of aortic lesions.

GEORGE E. BRIDLEY

Cotte G: Arteriovenous Aneurism of the Posterior Tibial Artery and Vein (*Anévrisme artérioveineux de l'artère et de la veine tibiales postérieures*). *Bull et mém Soc de chir de Par* 1916 xlii 2890

Cotte reports the case of a patient with an arteriovenous aneurism of the posterior tibial artery and vein which had been treated for an arteriovenous aneurism of the popliteal vessels and these vessels ligatured and resected. Some months later symptoms of aneurismal troubles reappeared with trophic disturbances and he came to Cotte's service. After examination satisfied of the tibial posterior situation of the aneurism, Cotte operated by resection of the tibial artery and vein with a complete cure.

Attention is called to two points particularly:

1. The insufficiency of intervention at a distance in the treatment of aneurism. In this case ligature and resection of the popliteal vessels gave temporary relief but soon trouble due to the aneurism reappeared.

2. The definite cure of these troubles following resection of the vessels attacked.

Not alone did ligature and resection of the tibial posterior artery and vein cause no circulatory troubles in spite of the ligature and resection already made on the popliteal and femoral but ischemic lesions, which were very marked, were also entirely stopped. The author believes therefore that radical methods are the surest means of avoiding gangrene.

W. A. BRENNAN

Varda: Traumatic Aneurism of the Left Femoral Artery; Extirpation of the Sac (*Anévrysme traumatique de l'artère fémorale extirpation du sac*). *Bull et mém Soc de chir de Par* 1916 xlii 2893

Varda relates the case of a man of 35 years who came to his service with the diagnosis of elephantiasis of the lower limb. His history showed that at the age of 13 years he had received a stab wound at the site of the most protuberant part of the present tumefaction. The wound healed at the time but six months later the region began to swell and fluctuate. The swelling had slowly continued until it spread over the entire leg.

When received into Varda's service the man could not stand on his feet and the general aspect of the left leg was elephantiasic. The circumference over the aneurismal sac was 61 cm. while the normal right leg measured 40 cm. at auscultation a thrill was distinctly perceptible which was isochronous to the arterial pulsations.

An incision was made following the trajectory of the femoral artery commencing about 8 cm. below Poupart's ligament and the artery exposed. The

fibers of the sartorius muscle were separated the aneurismal sac exposed and the clots removed, the central and peripheral vessel ends were found and ligated the sac was extirpated and the cavity drained.

By the end of a week the circumference of the left leg was reduced to 36 cm. and the patient left the hospital a couple of weeks later able to walk without crutches. He was seen a year later and was then working at his trade.

The point of interest in the observation is the long duration of the aneurism with no other results than the elephantiasis.

W. A. BRENNAN

Makins, G. M. Remarks on Effects upon Heart and Circulation of Wounds of Blood Vessels and on Variations in the Local Physical Signs Present at Site of Injuries. *Brit J Surg* 1917 v 53

There is an apparent enlargement and excited action of the heart commonly accompanying wounds of the blood vessels. These signs are fairly constant early and both tend to subside with rest in the recumbent position. The general condition of the soldiers as a group has been considered and ruled out as having no bearing as to the effects and signs under consideration. Also certain conditions met with in connection with arterial wounds which may be accompanied by both cardiac dilatation and increased rapidity of action, such as anemia, toxemia from serious local infection of the wound, and the presence of a large quantity of extravasated blood or blood-clot lying free in the tissues have been considered.

An arteriovenous communication is a more serious obstruction to and disturbance of the circulation than a simple defect in the arterial wall. An arterial leak causes an immediate fall in the distal blood pressure. In 23 cases the average difference in the peripheral blood-pressure between the normal and the injured limb was 21.4 mm. of mercury when tested by a manometer. Collateral circulation and time probably decrease this variation. The presumption is that compensation is more likely to occur if the aneurism remains untreated than after ligation of the artery. Ligation of an artery for the cure of a spontaneous aneurism in the limbs is sometimes followed by the development of one in the thorax. In 37 cases in which cardiac murmurs accompanied the presence of an aneurism, in 24 the apex was in the nipple line in 4 within that line and in 9 it was from 0.5 to 2.5 inches outside. In the majority of cases the vertical level tended to be raised and often into the fourth interspace.

Several skiagrams show the cardiac area in inspiration and expiration. Nothing abnormal is shown in inspiration while in expiration the enlarged condition of the heart is more than confirmed. This may be due to want of tone in the heart muscle rather than to a true enlargement. This condition resembles those cases diagnosed disorderly action of the heart and it is difficult

to determine which is primary although they do not have precordial distress rapid respiration or any pain. Acceleration of the pulse is a constant sign the rate varying from 80 to 120 with a mean average of about 90. Without doubt cardiac idiosyncrasy temperament and perhaps indulgence in tobacco may be contributory causes. The phenomena are certainly in part dependent on loss of blood.

Makins has not observed early pericardial dilatation of the vessel above the injury in the artery while distal constriction has been a constant feature.

Cardiac murmurs of a pronounced character accompany wounds of main blood-vessels the local aneurismal bruit being transmitted to the heart. The nature and explanation of these murmurs is not simple for they are temporary inconstant in occurrence, and heard especially in connection with certain vessels. Absence of suppression of the blood current in the vessel proximal to the wound is necessary to entirely banish the bruit. In pure arterial injuries the arterial murmur is loudest at the apex, or sometimes at the base of the left ventricle and as a rule is loud and distinct. In arteriovenous aneurisms or aneurismal varices the murmur is usually double the venous hum being continuous while the systolic element is commonly the more pronounced.

Of the 37 cases in which cardiac murmurs were detected occurring among a total of 80 instances of vascular lesions 16 were arteriovenous aneurisms, 9 purely arterial and in a varix only was diagnosed. In every instance the presence of the murmur was confirmed by more than one observer.

In local vascular murmurs considerable variations of tone and character are met with. The various varieties are described by Makins. The nature of the aperture the stage of stiffening from infiltration or clots, the length of the column of blood, the diameter of the vessels, the presence of a large collection of blood or clot in connection with the wound and the general conformation of the patient alter the murmurs.

Occurrence of systolic arterial bruits independent of an open arterial wound are distinctly rare. There may be a systolic bruit audible throughout the great vessels in conjunction with a severe secondary hemorrhage. A general arterial bruit of the pistol-shot or water hammer type may result as a sequence of hemorrhage. In patients dying from acute toxemia a general bruit may be heard over the vessels before death.

In purely arterial lesions the murmur is loud and can be heard more widely in the distal than in a central direction. The murmur is practically limited in distribution to the line of the vessels and the area of the limb occupied by the aneurismal sac if one is present. In arteriovenous lesions, the murmurs are conducted in both directions, the double bruit often the entire length of the limb while in the central direction the venous murmur is always conducted widely. Conduction of the local systolic

murmur to the heart is uncommon unless the wounded vessel is situated in the lower extremity. It occurred in 6 out of 24 axillary aneurisms, 37 out of 93 in lower extremities, and none in the neck or arms. The same applies in less degree to the arteriovenous or double murmur. The loudness of the cardiac murmur in no way corresponds to that heard over the wounded spot in the vessel or the aneurism. It is suggested that the direct course and the continuous gradual increase in the size of the vessel explains these phenomena, and the vibrations may be mainly conducted by the arterial wall. The cardiac murmurs are only temporary phenomena.

Makins gives a table one reviewing 24 cases, giving the vessel injured, nature of the lesion, blood-pressure operation, blood-pressure after operation, and remarks the second containing 37 cases in which lesions of systemic vessels with murmur conducted to the heart are studied. CARL R. STENSTEDT.

Newcomet W S The Treatment of Naevi. *Am J Surg* 41 97 605

While many methods have been recommended for the treatment of these various forms of birthmarks, none are ideal nor can any one method be applied successfully to all the various forms. Therefore the various methods of treatment must be considered and applied according to the demand of the case. These marks should be treated as soon after birth as is practical as they greatly enlarge in the first few years of life and furthermore if a scar is produced the growing tissues are far more likely to obliterate it. The cosmetic result in these cases will be in proportion to the skill of the operator. Many failures can be attributed to inexperience. While there is no doubt that the best results in general will be obtained from radiation, it must be remembered there are certain dangers, and even the most experienced will at times obtain undesirable burns that will produce permanent disfigurement that will be far more unsightly than the original trouble.

Naevi vary from the flat pigmented mole to the large cavernous type of tumor.

The following conclusions are drawn.

There is no ideal method for the treatment of birth marks.

While certain methods are better adapted to certain classes of these marks, the results obtained depend largely upon the experience of the operator.

Any form of radiation employed in the treatment of naevi is attended with some risk.

Whatever method is selected or employed, the first application should not be exaggerated. It is easy to repeat the process but difficult to remove the scars.

Consideration must always be given to the trophic influence, which differs in proportion to the size and depth of these vessels and is difficult to control.

The earlier in infancy some form of treatment

is adopted the better will be the result as involution will often continue when once a retrograde process is started until the mark disappears entirely.

POISONS

Stauff S: Chronic Tetanus *Zentralbl f Chir* 1916 No 46

The author presented two cases of very chronic tetanus and late tetanus with very unusual symptoms.

In the first patient spasms had been occurring in the thigh for 15 months the flexor and adductor muscles being involved. There was also slight tenseness of the long muscles of the back and of the left gluteals. Straining and mechanical irritation aggravated the spasms and also induced general phenomena. In general the patient looked like a well man. Generalized convulsions of a more serious nature had never occurred. The peculiar clinical picture naturally led to all kinds of mistaken diagnoses.

In one instance a case was under the observation of a nerve specialist in a sanitarium for nervous diseases. A diagnosis of spinal tumor was made and the case referred to a hospital for operation which however was not performed. The case was observed for a long time also by the author and with the assistance of Liebman a nerve specialist, the correct diagnosis was finally made. The deciding point in the diagnosis was the serologic examination made by Kneuter a definite agglutination for tetanus being obtained. X-ray examination further showed a large shell fragment in the musculature of the thigh. The localization of the fragment was extremely difficult. An attempt to remove the shell fragment again produced tetanus.

In the second case the convulsions had lasted for four months and began as a generalized tetanus. For the past two months the spasms have been confined to the left leg. In this case also a shell fragment was found in the hollow portion of the sacrum which will later be removed. The serologic examination was also positive in this case. This man was very emaciated on account of the generalized tetanus and appeared to be very sick.

The pathogenesis of the cases could be explained as follows. The toxins of the tetanus bacilli adhering to the foreign body are absorbed with difficulty through the granulations and connective-tissue capsule. Traumatic stimulation, active as well as passive favors the absorption of the toxins.

The rational treatment of course would be the removal of the foreign bodies. A third case like the two shown however proves that healing can occur without the removal of the shell fragments.

In the discussion BUNGART reported a case of chronic tetanus which was cured. The patient received a shell wound in the thigh February 22 1915. Tetanus set in on March 7th. The patient was treated in various hospitals with large doses of antitoxin and magnesium sulphate injections with

out success. A chronic tetanus developed and the patient was brought to the author's hospital, where operation was performed December 31 1916 and the shell fragment with its surrounding tissue was excised *en masse* from the thigh. Tetanus bacilli were found in the tissues. In the beginning the number of attacks did not diminish but the severity soon decreased. Ten days after the operation the number of attacks decreased. After three weeks no further attacks occurred. Following orthopedic and surgical measures the muscles finally relaxed. At present the patient walks like a well man. The interesting factor in the case is the long incubation period and the rapid disappearance of the attacks after the removal of the fragment. In such chronic cases the operative removal of the shell fragment and other foreign bodies seems to be the only method by which a cure can be effected which certainly is not the case in the early stage of the disease.

L. A. JUNKKE

Kreuter E. The Modern Treatment of Tetanus (Die moderne Behandlung des Tetanus) *Beitr z Klin u Infektionskr* 1916

The author calls attention to the extensive distribution of the tetanus bacillus. It is present in the hoofs of horses in 90 per cent of cases and in the hoofs of cows in 100 per cent. The poison of the bacillus consists of two components the tetanolysin which is unimportant and the tetanospasmin which alone produces the clinical phenomena of the disease. The transportation of the poison by the blood stream and lymph stream has been underestimated heretofore. The most important part of entrance is by way of the axis cylinders of the motor nerves.

As regards the treatment Kreuter is opposed to cauterization and burning as the scar formation creates an anaerobic soil favorable to the development of the bacillus. Hydrogen peroxide and tincture of iodine are our best drugs the latter was recommended as specific by the veterinarians. Balsam of Peru has also been advised (Ritter Sonntag) likewise chlorine by Riehl. In the form of chloride of lime which in the proportion of 1 part of lime to 9 parts of bolus alba is dusted into the wound Bier's hyperemia and suction treatment is unimportant. Antitoxin injected directly into the wound is also of doubtful value. If necessary that anesthesia be employed chloroform should be chosen especially if convulsions are already present.

In a later chapter the antitoxin treatment is taken up in more detail. It is emphasized that the quantity of serum is not the important factor but the number of antitoxic units it contains. As a prophylactic dose one subcutaneous dose of 20 antitoxic units is sufficient. The all important point is to give it immediately after the injury. Anaphylaxis must be considered. It is therefore absolutely necessary to avoid giving an intravenous injection 10 to 14 days after having given a prophylactic dose—it might be given intraspinally—but per

haps it would be best to treat the patient symptomatically.

With the beginning of serum treatment all circulating poisons are neutralized and the nerves carrying the poison are blocked. The results are bad with the subcutaneous injection of the serum, the serum being also bed too slowly. Behring's opinion that 100 antitoxic units are sufficient to effect a cure has been disproved. With the beginning of symptoms 200 antitoxic units should be given intravenously immediately, and the dose increased daily as necessary even until 500 units are given at one dose. In general, however, the injections should not be continued for more than 10 days. The endo cural method of injection is too uncertain and frequently necessitates operative interference. One hundred units are considered as the individual dose of the nerve injection. With the intraspinal method of application the antitoxin reaches the blood and lymph very quickly and also prevents the toxin traveling in the nerve from reaching the spinal structures. The author recommends this method from personal experience with it. After withdrawing a corresponding amount of liquor cœli 50 units are injected into the canal and this may be repeated daily without any danger. The intracerebral, intra-arterial and pleural methods of injection have been discontinued.

In the symptomatic treatment of tetanus magnesium sulphate is applied subcutaneously the maximal dose being about 5 gm. per kg. of body weight. In general a dose of 0.5 to 7 gm. per kg. is given. Intravenously and intramuscularly magnesium sulphate has been given up to 5 per cent solution, but has not been tried sufficiently. The intraspinal method of injection is reserved for severe cases. One must be prepared for resuscitation in case of cessation of respiration. The carbolic acid treatment of Bacelli consists in the injectio subcutaneous of 1 to 3 per cent solution, the beginning dose being 5 ccm. The carbolic acid has a quieting effect upon the nervous system. The inhalation treatment of ether and chloroform deserves mentioning, the danger of bronchopneumonia with ether and parenchymatous degeneration of organs with chloroform, however, limits its use. Chloral in doses of 15 gm. per day is well borne. It is best given per rectum. Large doses of morphine are necessary 0.15 gm. per day have been given without injury for a few days. The following remedies deserve mention: pantopon, potassium bromide, cocaine, sulfonal and urethane. Curare is variously discussed. Luminal employed in a 10 per cent solution subcutaneously is also recommended, even salvarsan has been employed.

The surgical symptomatic measures are discussed. Tracheotomy must be employed in severe cases and in sudden attacks of asphyxia. Bilateral phrenicotomy with later artificial respiration was employed successfully once by Sauerbruch. In the presence of severe pharyngeal cramps gastrostomy or cesophagostomy must be considered.

In the closing chapter the general treatment is briefly discussed and artificial high altitude sunning enthusiastically advised.

The monograph contains 393 references and is highly recommended for proper orientation regarding this very important subject. L. A. JONES.

SURGICAL DIAGNOSIS, PATHOLOGY AND THERAPEUTICS

Hall A. J. The Treatment of Burns by Paraffin. *B. M. J.* 9 7 1 37

The original substance used by the French is prepared by B. ribe de Sandfort and was called ambrine. A similar substance may be prepared by impregnating hard paraffin with a small quantity of tar.

The main advantages of this method of treating burns seem to be: (1) the protection of the burn from the air; (2) the protection of the newly-formed granulations from damage; and (3) the splint-like effect of the wax in holding the damaged tissues in position and at rest.

The method consists of the following steps: (1) The burn is washed with sterile water and dried, an electrical drying apparatus is useful in accomplishing this step. (2) The burn is covered with a layer of paraffin at a temperature of 50 C. This is usually accomplished by means of a broad camel-hair brush. Sprays are sometimes used but easily get out of order. (3) A thin layer of cotton wool is next applied to the burned area. (4) A second layer of paraffin is then applied over the layer of cotton wool. A layer of cotton and a bandage then complete the dressing.

The burns are dressed daily, later every other day. J. H. SMITH.

Lewis, D. S. The Clinical Value of Ambard's Coefficient of Urea Excretion. *Arch. Int. Med.* 9 7 11

According to Ambard the rate of output of urea varies directly as the square of concentration of urea in the blood, and inversely as the square root of that in the urine. This law may be expressed in the following formula:

$$K = \frac{Ur}{\sqrt{\frac{D}{P} \times \frac{1}{W} \times \frac{1}{S}}}$$

Where K is the coefficient of urea excretion. Ur is grams of urea per liter of blood. D is output of urea in grams in twenty-four hours. P is weight of patient in kilograms. C is grams of urea per liter of urine, 70 is the standard weight in kilos. S is the standard concentration of urea in urine.

Lewis studied the laws of function as laid down by Ambard and arrives at the following conclusions:

1. The laws of functions are not followed with mathematical exactness in young and active indi-

viduals but under routine conditions they are remarkably accurate. They are correct in principle.

2 The coefficient of urea excretion is subject to normal variations in normals, but any value below 0.06 or above 0.09 should be regarded as abnormal unless the excessive variation can be readily explained.

3 The coefficient is absolutely independent of the blood urea concentration. Its level is governed by the condition of renal function.

4 The coefficient is depressed in fever in hyperthyroidism in hypertension with early changes in the renal arterioles and in early chronic diffuse nephritis. The depression is an evidence of increased renal activity due to irritation.

5 The coefficient is raised in myxœdema.

6 There is an increase in the coefficient in myocardial insufficiency.

7 The coefficient is above normal in nephritis with renal insufficiency. This increase is more evident in chronic diffuse nephritis than in the vascular type, due to the greater frequency of renal insufficiency in the former cases. The coefficient shows an increase long before there is any evidence of nitrogen retention in the blood.

8 This test agrees very closely with the phenol sulphonephthalein test.

9 The prognostic value of the coefficient is considerable. Values above 0.2 are seen only in the severe cases, while constants persistently above 0.3 are found only in persons with a maximal impairment of renal function.

MAX KAHN

EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Gilbert, Q. O. The Occurrence of Nuclear Changes in the Red Blood-Cells Following Splenectomy. *J. Med.* 1917 xix 140

The author calls attention to the fact that the relation of the spleen to the destruction of red cells and to the catabolism of hæmoglobin has often been emphasized whereas much less has been noted concerning the function which the spleen may have in controlling or effecting the histogenesis of these cells. He states that the view that the histogenesis of red corpuscles is in some way dependent on splenic function is based primarily on the observation that following splenectomy the red blood-cells show nuclear particles (so-called Howell Jolly bodies) which were not present before the operation.

He reviews the work of several authors who have called attention to these nuclear particles in the blood of patients whose spleen has been removed but as Gilbert says in most cases no mention is made of their occurrence before operation presumably because until recently attention has not especially been called to their constant appearance in such large numbers immediately following splenectomy.

He therefore studied three cases with special reference to the changes which occurred in the red blood

cells. These cases have been very carefully studied and are very completely presented and illustrated.

In summing up the results of this study there seems but little doubt that a close relationship exists between the loss of splenic function and the appearance of large numbers of nuclear particles in the blood. The author has shown as has been observed by others that the nuclear particles occur in large numbers within a few hours after the removal of the spleen and continue to be present after the blood has become in other respects normal. That they may occur independent of a primary blood disease is shown by the fact that they occur after the spleen has been removed in normal animals and in men (traumatic rupture of spleen.) In no other conditions are they found with such constancy and in such large numbers as after splenectomy be observed.

The author's studies have shown further that there is no definite numerical relationship between the nuclear particles and the presence of true nucleated red cells or any other quantitative or qualitative changes in the peripheral blood. His preparations indicated that the nuclear particles originate from otherwise normal nuclei and that the particles do not show in themselves qualitative degenerative processes.

It is true the author states that following splenectomy there is evidence of increased bone marrow activity as shown by the increase in the number of nucleated red blood-cells by the immediate increase in the polymorphonuclear neutrophils and by the increase in the large mononuclear and transitional forms. He includes here the transitional and large mononuclear forms he states because, as shown by Evans and to a less extent confirmed by him with the indophenol reaction these cells in a large part at least come from the bone marrow. These evidences of increased activity on the part of the bone marrow later subside while the nuclear particles still persist.

His staining reactions have shown these particles to be true nuclear material and his drawings illustrate the way they arise from the nuclei of red blood-cells and since nuclear particles are present due to the removal of the spleen he concludes that the spleen in some way affects the normal disappearance of nuclear matter from the red blood-cells. Such nuclear particles have been described in bone marrow but to what extent apparently has not been determined. It is possible he thinks that it is a question of an abnormal course of an otherwise normal process or that the process of denucleatization is arrested or slowed at some intermediary point so that cells with the nuclear particles on the way to extrusion escape to the peripheral blood.

From the fact that they occur without any definite relationship to normoblastic crises and persist regardless of the condition of the blood whether after splenectomy in experimental animals in man with or without blood diseases or in conditions of recovery after splenectomy in definite blood diseases

It seems to him that they are not definitely associated with the process of regeneration or at least cannot be taken as an index of regeneration.

It is possible, he states, that the loss of the splenic function so affects the ripening process of red cells that a more resistant cell is produced, and to this may be attributed in part at least the beneficial results of splenectomy. G. E. B. U.

Falk, K. G. and Sugturs, K. The Elimination of Hexamethylenetetramine (Urotropine) as an Index of Renal Function. *J. Lab. Med.* 1924, 24.

In this paper particular attention is given to a method of estimating the elimination of hexamethylenetetramine (urotropine) in cases involving impaired kidney function. The author made use of the method described in a paper published about a year ago except that with albuminous urine the protein was removed by a suspension of lumnum hydroxide in water instead of methyl alcohol. To 50 ccm of the albuminous urine 1 ccm of the alumina cream was added slowly with stirring. After the protein had settled the mixture was filtered through a folded paper. The precipitate on the paper was allowed to drain thoroughly and the hexamethylenetetramine was determined in the filtrate by precipitation with iodine. The customary 3% alcoholic solution of iodine was added from a burette gradually with constant stirring.

The general conclusion which the authors draw from their results is that the excretion of hexamethylenetetramine should prove of value as a test for impairment of renal function. G. E. B. U.

Eusterman, G. B. Syphilis of the Stomach. Clinical and Roentgenological Study with Report of Twenty-three Cases. *Am. J. Med. Sc.* 1924, 24.

The author reports a series of 23 cases observed at the Mayo Clinic during the last seven years. After a careful study of these cases, he concludes that the condition is not so rare as is generally supposed. The aid of the Wassermann-Nogu reaction and the roentgen rays is necessary to establish the presence and the specificity of the lesion.

The diagnosis is based on history, findings on a constant positive Wassermann reaction, indisputable evidence of a gross gastric lesion and (excluding cases of reparable disease) a permanent cure by purely antisyphilitic measures.

The symptoms are suggestive of benign ulcer while the gastric hematemesis and roentgen findings rather suggest carcinoma. Anacidity or achylia is characteristic of the majority of the cases.

Extensive gastric involvement is often present when the gastric disturbance first becomes manifest.

A gummatous ulcer usually multiple and especially a diffuse syphilitic infiltration with co-tractures thickening and perigastric adhesions

chiefly of the pyloric segment is the usual pathological picture.

Results from antisyphilitic treatment are encouraging in all but very advanced cases. Surgical interference is indicated in some cases. Early diagnosis and intensive treatment invariably result in symptomatic cure and structural improvement. I. GIERER.

Kon, Y. Adenoma Formation in the Stomach of Rabbit by Feeding with Lanolin. *J. Med. Res.* 1924, 33.

For the purpose of this experiment 1 study the author gave to rabbits weighing about two kilograms 4 grams daily of lanolin mixed with bean-curd (soy) (Japanese Okara). A few died during the first few weeks with intestinal disorder and the rest lived much longer.

The twenty rabbits were fed with lanolin, the shortest duration of the feeding being five days, the longest 54 days (one over 184 days, three over 33 days).

The direct cause of his experimental adenoma formation the author attributes to the continuous accumulation of lipid by the above mentioned method of feeding and undoubtedly he says, this accumulation of lipid produces growth of the epithelial cells. He is doubtful as to whether the adenoma produced in his experiments could be transformed to carcinoma by still further feeding the animal with lanolin, but calls attention to Yamagata's cases which show that the simple papilloma can be transformed into the carcinoma by further application of the coal-tar and he considers it desirable to continue the experiment to decide this question.

The author's experiments showed a general accumulation of cholesterol in the body of rabbits by feeding with five grams of lanolin daily and there were found a leiomatous growths on the mucosa of the pylorus of the stomach. Out of 9 rabbits fed over 80 days 5 presented the above described change.

The change of the mucosa began at first on the tunica propria with accumulation of anisotropic lipid substance and the, with extension, convolutio and branching of the gland and a growth of connective tissue of the interglandular tissue especially, one of his cases showed the thickness of the mucosa about 12 times larger than normal.

The growth of glandular tissue was distinctly limited to the muscularis mucosa and could not be found in the submucous tissue nor did it enter into the blood and lymph-vessels and there was no formation of metastasis. GEORGE E. BRIDGES.

Jones, F. S., and Roux, P. The Phagocytic Power of Connective-Tissue Cells. *J. Exp. Med.* 1924, 39.

The authors found that suspensions of individual, living cells from the fixed tissues can be obtained by digesting with trypsin the clot of proliferating

tissue cultures. Certain of the cells thus freed especially those of connective tissue and the sarcomata, will survive in Locke's solution for many hours, they state and proliferate when reimplanted in plasma. The method has made possible direct tests of the phagocytic power of fibroblasts.

For their experiments bits of the heart and skeletal muscle from embryo chicks in the third week of incubation from embryo rats near to term and from rats two to five days old were implanted in plasma of the appropriate species. Special care was taken to rule out the presence of blood since some of the white cells might by their phagocytic activity have introduced confusion into the results. The tissue was washed free of blood by perfusing the animal with Locke's solution injected into the heart and the effectiveness of the washing as well as the normality of the tissue was controlled histologically. The plasma was centrifugized at high speed and the central portion drawn off for use through a fine pipette. The microscope showed it to be cell free.

By the tryptic digestion of cultures *in vitro* of avian and mammalian connective tissue suspensions of individual living cells were obtained. Their ability to phagocytize carmin and bacteria was tested. The great majority of them failed to take up either but a few large cells were able to do so. They ingested bacteria only when serum was present that is they required the interaction of opsonins. There is good reason to suppose the authors believe, that the phagocytic cells are endothelial in nature. Should they prove to be fibroblasts, like the other elements present the fact will remain that the phagocytic power of fibroblasts is practically negligible. Their failure to ingest foreign matter *in vitro* is to be laid the authors believe not to the obstacles offered by the solidity of the tissue they compose but to an inherent lack of ability on their part. The phagocytosis of blood pigment bacteria etc. which takes place in granulation tissue *in vivo* they think is probably carried on wholly by endothelial cells and wandering cells.

GEORGE E. BILEY

Burrows, M. T. and Heymann, C. A.: Studies on the Metabolism of Cells in Vitro: the Toxicity of α -Amino Acids for Embryonic Chicken Cells. *J. Exp. Med.* 19 7 xiv 93.

As the authors state a synthetic medium suitable for the growth of tissue cells outside of the animal organism has not been discovered up to the present time. Since the preparation of such a medium would probably lead to a better understanding of cellular metabolism this problem has stood forth as one of the most important of those presented by the tissue-culture method.

From earlier observations evidence had already been obtained which showed that the ingredients essential for the building of new cells and the liberation of energy in the cultures comes directly from the tissue fragments. The growth observed is a manifestation of a simple transfer of materials from the

more central portions of the fragment to the cells at the periphery or, in other words the preying of one cell in a more suitable environment upon its neighboring cells in an unsuitable one. This is true the authors state in cultures where simple isotonic salt solutions have been used as the medium. That it is also true in the case of the plasma culture they believe can be readily shown by repeatedly changing the medium or transplanting the cells to drops of fresh medium. All activity ceases after a few transplants or when the cells within the fragment have become exhausted.

In the present series of experiments the authors tried to determine whether the addition of any substance to the plasma would prolong the growth of the cells. The addition of certain carbohydrates and fats did not affect the growth to any degree. During the course of further experiments they had the opportunity to try certain hydrolytic products of the protein of egg yolk. Since the results of these experiments appeared to the authors to have a certain interest in themselves they decided to report them separately in this paper.

The tissues used for these experiments were heart muscle and pieces of the body wall of chick embryos and fetal chickens. The control medium for the experiments consisted of one part of fresh plasma containing a moderate amount of fat and one part of a 0.0 per cent sodium chloride solution. In the experiments the same proportions were used one part of the isotonic solution of the substance to be tested was added to one part of the same plasma.

The authors also experimented with α -amino acids. They found that the complete hydrolysis of egg yolk promised a yield of α -amino-acids in the same proportions as they actually occur in the protein molecule the only α -amino-acid which did not give a yield on acid hydrolysis being tryptophane. This seemed to them to be the easiest and most direct method of procedure. Consequently a digestion mixture was prepared by dissolving dried egg yolk from which the fats had been extracted with ether by means of a Soxhlet apparatus in a 70 per cent (by weight) solution of sulphuric acid.

Summing up their results they found that all the ten α -amino-acids used inhibited the growth of the cells and finally killed the cultures. This inhibition was preceded by a short period of activity. The typical effect on the cells is shown in illustrations in the original article the first being a control culture showing the usual growth of cells and their typical spindle shape form, and the second being a culture in plasma plus asparagine showing the cells rounded off and beginning to undergo dissolution.

The authors do not wish to draw too extensive conclusions from these experiments but they do believe that the toxicity of α -amino-acids toward growing cells has been shown beyond a reasonable doubt while they have found that compounds of higher molecular weight namely the peptones of egg yolk, and proteins are non-toxic. This toxicity

depends upon the concentration and the time that the cells are exposed to their action. As these factors are reduced the toxicity is decreased. In this respect these substances are similar to all cell poisons.

Applying these results to the work done on the intravenous injection of digestion mixtures the authors believe that they have found a reason for the death of the experimental animals when the hydrolyzed proteins were injected too rapidly. Banglia found that large amounts of α -amino-acids could be injected into the circulation without causing deep-seated changes in the renal and intestinal functions, provided they were injected slowly enough. In fact that enough of these mixtures could be injected in this way to cover the nitrogen consumption of the body. This injection, however, was always accompanied by an α -amino excretion through the urine and an increase of the penetrability of the intestine with resultant liquid stools. As is well known, a sudden great concentration of these substances in the blood of an animal causes death. These results agreed with the author's findings.

Folin and De Lander demonstrated the fact that α -amino-acids probably pass into the circulation through the intestines. Van Slyke and Meyer by means of Van Slyke's nitrogen method have practically proved this, and Abel, R. W. and Turner and Abderhalden have lately succeeded in obtaining α -amino-acids in a crystalline form from the blood. Van Slyke and Meyer the authors state have shown that the tissues take up α -amino-acids to a certain point but that after that limit of saturation is reached. Thus, they claim is not so in the liver which continually desaturates itself by metabolizing the α -amino-acids that it has absorbed and consequently maintains indefinitely its power of removing them from the circulation, so long as they enter it no faster than the liver can metabolize them. The authors draw attention to Marshall and Rowntree's findings that there is an increase of the α -amino-acid concentration in the blood after injuries to the liver which have caused deep-seated anatomical changes. Their experiments they state prove that tissue cells in general are unable to live in the presence of any great concentration of these acids.

At present the authors do not feel able to give an explanation of the significance of this evident toxicity. However they state the fact in itself seems to indicate that they should expect stimulation from a certain increase of the α -amino-acid concentration in the body of the concentration, of any one of the acids while a great increase would lead to marked disturbances of the metabolism.

GEORGE E. BRIDGES.

Wotzfeldt K. Experimental Studies on the Relation of the Pituitary Body to Renal Function. *J. Exp. Med.* 97: 271, 53.

In recent papers the author first dealt with the clinical aspects of the relation between the pituitary

body and the kidneys especially with regard to the etiology and pathology of diabetes insipidus. He has come to the conclusion that the pituitary body as shown by its extracts exerts a constant physiological influence on the functional activity of the kidneys in human beings. This action consists in a checking of the flow of urine—an antidiuretic effect which is not marked when the diuresis is high. He has also reported a case of diabetes insipidus in which organotherapy with the posterior lobe of the pituitary body has been successfully carried out for a period of about two years.

However he believes that this subject opens up a new field of experimentation of great importance, not only from a physiological point of view but from the promise it gives of an improved therapy.

His experimental work was begun on dogs, but experience soon taught him that rabbits were more suitable for this purpose and the majority of the experiments therefore have been carried out on these animals.

He studied the effect of pituitary extracts and the action principles of the hypophysis in order to determine which part of the pituitary body contained the active principle. His observations include the influence upon the nervous system and the effect it has upon other ductless glands when used in varying amounts for varying periods of time. From his study he draws the following conclusions:

The inconsistent results of past observations on the relation of pituitary extract to renal activity have been due chiefly to unsuitable methods.

A standard curve of artificially induced polyuria may be plotted for rabbits giving 500 ccm. of water by mouth.

1. Extracts of the pars intermedia and posterior lobe of the hypophysis given by mouth subcutaneously or intravenously are able definitely to check polyuria thus induced. Extracts of the anterior lobe showed a similar effect but only to a slight degree.

2. This antidiuretic effect was constant and independent of (1) changes in blood pressure, (2) intestinal absorption, and (3) the vagi. The effect is apparently prevented or delayed, he states, by division of the splanchnics and is diminished by division of the renal nerves near the hilum.

3. A similar antidiuretic property is possessed (1) by β -imidazoleylethylamine (2) by α -oxyphenylethylamine (3) by preparation from *Secale cornutum* (4) by small doses of nicotine (5) by large doses of caffeine and (6) by extracts of the adrenal cortex.

4. Effect on the polyuria was produced (1) by strychnine (2) by morphine (3) by adrenalina, or by extracts of (4) thyroid (5) thymus, (6) pineal, (7) pancreas or (8) corpora lutea.

In animals under chloral or paraldehyde anesthesia a short and instantaneous increase in flow of urine was seen. The antidiuretic effect was absent or only slightly marked in checking the so-called salt diuresis.

These facts tended to suggest to the author that the antidiuretic action exerted by pituitary extracts on rabbits is caused by stimulation of the sympathetic nervous system and that the renal vasomotor system in this respect is of chief importance. Clinically these conceptions bring the polyuria as related to disorders of the nervous system and the polyurias of pituitary origin in closer contact the author states.

GEORGE E. BELLAY

Mendel L. B.: Abnormalities of Growth. *Am J Hyg.* 1917 cliii 1

Mendel states that the factors which determine the possibility of growth and upon which therefore, any broad generalizations regarding the abnormalities of growth must be based may be classed with respect to the organism involved as internal or external in character. The internal factors include the real impulse to grow of whatever nature it may be in part they are inherited they belong to the permanent biological characteristics of the individual. Heredity he states with all that it involves determines the most potent of these internal constitutional incentives and conditions of growth and these are the determinants which are largely beyond immediate control, yet must be reckoned with when defects of growth appear. The external factors that modify growth on the other hand, he states, are more amenable to directive regulation. The environment as well as the food of the individual can be modified more or less at will. This he considers a possible point of attack for if growth implies not only a capacity to grow but also an actual increment of body substance there must be an accession of nutriment from without. The character of the food its utilization and metabolism in health and in disease are open to investigation. The study of nutrition in growth, therefore seems to him to offer the most promising of all the modes of approaching an understanding of this fundamental biological process.

Mendel has carried on some very interesting investigations, the results of which may be summarized as follows:

The growth impulse, or capacity to grow can be retained and exercised at periods far beyond the age at which growth ordinarily ceases. In the case of his experimental animals albino rats in which increment of bodily weight ordinarily ceases before the age of 300 days resumption and completion of growth were readily obtained at an age of more than 550 days. He, therefore, believes it reasonable to ask whether the capacity to grow can ever be lost unless it is exercised. Even after very prolonged periods of suppression of growth he states, the rats can subsequently reach the full size characteristic of their species. In this respect there is no impairment of the individual.

The satisfactory resumption of growth can be attained, he believes not only after stunting by underfeeding but also after the cessation of growth which results when the diet contains proteins un-

suitable for the synthetic processes of growth or is low in protein. Growth in the cases referred to is resumed at a rate normal for the size of the animal at the time the anthesis states. It need not be slow and frequently it actually exceeds the usual progress. The size or age at which the inhibition of growth is affected also does not alter the capacity to resume growth. Even when the suppression of growth is attempted for very long periods at a very small size (body weight) the restoration may be adequate when a suitable diet is furnished and the procreative functions are not necessarily lost by prolonged failure to grow before the stage of development at which breeding is ordinarily possible.

The period of growth he believes may be greatly prolonged by inadequacies in the diet so that growth becomes very slow without being completely inhibited. Though the time of reaching full size is thus greatly delayed growth as expressed by suitable body weight can ultimately be completed even during the course of long-continued retardation, he states.

Mendel believes the methods of partially retarding or completely suppressing growth to be too varied and unlike to permit final conclusions as yet regarding the outcome of all the procedures of inhibition for the subsequent welfare of the individual. His observations apply to the effects upon size and a few other incidental features mentioned. Although he considers it doubtful whether the fundamental features will be altered far reaching dogmatic statements seem to him to be scarcely justifiable until the experiments have been extended to include other factors and animal species.

GEORGE E. BELLAY

Wolferth C. C.: Blood Changes in Albino Rats Following Removal of the Spleen. *Ir A J Med* 917 xix 105

During the course of studies on the albino rat in regard to the relation of the spleen to the other glands of internal secretion the author had previously noted certain changes that occur after splenectomy and it therefore seemed to him desirable that a somewhat systematic study should be carried out. As a result of his study and series of experiments the author believes that there is no important function peculiar to the spleen. The slight transient alterations following splenectomy together with the new lymphoid tissue, makes it seem likely to the author that this lymphoid type of tissue normally shares with the spleen certain of its duties and in the absence of that organ is capable of assuming a large part of the burden. If a diseased spleen were removed the results of splenectomy would be expected to be less in degree than usual because compensation for splenic function had already partially occurred.

The author calls attention to Munster's observation that in some chronic conditions the spleen may have been diseased so long and so extensively that a vicarious compensation of its function by other

organs may have occurred, thus obscuring the effect of removal which idea was expressed also by Meyer who excluded observation after removal of the spleen for leukæmia pseudoleukæmia and malaria e largement Banti disease tuberculous echinococcus cyst a d purulent affections from the d t of pure experim nt beca se compensation might be expected t ha e occurred

When a normal spleen is removed th alterations which result depend on the capability of related tissues to carry on in entirety the part ular functions whi h had been in part performed by the spleen. The extent of the alterations probably d pends in part on the amount and functional capaility of the substituting tissues, the duration o th rapidity with whi h these tissues undergo f unctional hypertrophy

If how ve conditions of some sort were present in the body demanding increased function of the type carried n by the spleen i response to which that organ had hypertrophied the large f or f sal ty which is p sent in the normal normal w uld not be expected after splenectomy. An exaggeration of the phenomena that usually occur after splenectomy would be looked for

As the autho states as far as known with c tainty at the present time the ly untw i es it of splenectomy is anemia. This anemia is nable as to degree and duration, probably d pent g in an inverse relation on the functional capaility of the tissue ready to take the place f the spleen. Therefore he says, if a truly hyper tention spleen were removed se ere anemia would be expected to develop which result has occurred in all his rats with enlarged spleens. The cause of the anemia he cannot explain at the present time but certain phenomena in connection with t stand out so prominently as to be suggestive t him in their relation to the rôle of the spleen in the mechanism of blood destruction and egeneration.

The hematogenic functions he considers not only unimpaired, but capable of tremendous activity the absence of the enlarged spleen which is shown during the periods of seve e anemia when at times nearly every cell in the circulating blood is a young f rm. Thus he is f ed to the conclusion that the anemia is due to increased hemolysis. Th rapidity of development f the anemia, he believes, the jaundice the overwhelming preponderance of young red cells in some cases almost to the exclusion of other types plainly points to this conclusion

The author studies the results of splenect my in 16 rats whose spleens were presumably normal also in 8 rats with enlarged spleens

Rats after excision of normal spleen showed a slight transient anemia slight tendency to leucocytosis well marked increase in resistance of erythrocytes, no change in percentages of reticulated red cells. There was n inconstant increase in the number of nucleated red cells during the periods of anemia

The removal of enlarged spleens was followed by

rapid and usually fatal anemia, hyperleucocytosis, marked increase in the number of nucleated and reticulated red cells and in two of his cases, by distinct jaundice.

The variability of results following splenectomy the author considers to be due to several factors, including the functional activity of the spleen and the functional activity and ability to compensate on the part of the tissues with function similar to that f the spleen

From the associated phenomena it appears to him almost certain that the anemia which develops after the removal of an enlarged spleen is of hemolytic type thus more evidence is brought forward that the anemia of splenectomy is of hemolytic origin

The type of function exerted by the spleen, he states in the mechanism of blood destruction and regeneration is necessary to life. Usually after the removal of the spleen there are left in the body other tissues capable of carrying on the function successfully. Under circumstances in which the function cannot be successfully assumed by other tissues removal of the spleen would be attended with disastrous results he believes.

GEORGE E. BRIDLE

Smith M. L., and Hatcher, R. A. A Contribution to the Pharmacology of Stovaln. *J Pharmacol. Exp Therap* 9, 11, 3

The authors call attention to the fact that there is an tle literature relating to the uses of stovaln as a local anæsthetic and more especially in spinal anæsthesia but its behavior in the body after its absorption into the blood stream has received little consideration at the hands of pharmacologists, and more definite knowledge is needed of its relative toxicity and anæsthetic activity as compared with cocaine and other locally acting members of this series

They carried out an extensive series of experiments, the results f which may be summarized as follows

The experiments carried out afforded no evidence that stovaln exerts any direct action n the blood vessels after the intravenous injection in cats and it failed to change the caliber of the renal vessels of the cat or dog when perfused in concentrations of 0.000 to 0.500. It depressed the heart when toxic doses were injected intravenously and when the rabbit's heart was perfused with solution containing part of the drug in 10,000 parts of Locke's solution.

1. Stovaln caused death by inducing immediate and simultaneous paralysis of the heart and respiration, the action on each being independent of that on the other. It disappeared rapidly from the blood stream after its intravenous injection.

2. Little or none of the drug was excreted unchanged in the urine of the cat

3. Stovaln was removed from perfused fluid by the liver in which it appeared to be destroyed.

5 The fatal dose of stovaine for the cat or rabbit was about 30 mg per kilogram when a solution of 1:100 was injected rapidly into a vein. Somewhat more was required when dilute solutions were used. Complete recovery followed the injection of a toxic but not fatal dose within a short time and several times as much as a single fatal dose might be administered within a few hours if small portions were given at short intervals. Very large doses were required by subcutaneous injection to cause death.

Stovaine was found to be slightly but distinctly more toxic than novocaine by similar modes of administration and complete recovery did not follow the administration of toxic doses of stovaine so promptly as it did that of corresponding doses of novocaine.

GEORGE E. BRILBY

Robertson T. B.: Recent Investigations on the Influence of the Anterior Lobe of the Pituitary Body and on the Properties of the Growth-controlling Constituent Tethelin. *Endocrinology* 1917: 24.

Robertson believes that the well known clinical manifestations of hyperactivity of the anterior lobe of the pituitary body all point toward an intimate association between the physiological activity of this organ and the growth of certain tissues particularly the bones and epidermis. If the incidence of the hyperactivity be pre-adolescent he says the resultant is usually some measure of gigantism while if the incidence of hyperactivity be post-adolescent the manifestations are usually of the acromegalic type.

He then reviews some of the attempts that have been made to reproduce in the laboratory some of the clinical manifestations of hyperpituitarism by the administration of pituitary tissue to animals.

It is pointed out that hyperplasia of the anterior lobe of the pituitary body is notoriously associated with gigantism and acromegaly. On the other hand, he states, pathological conditions resulting in partial or total destruction of the anterior lobe of the pituitary body are associated with a clinical picture of adiposity under-development of the skeletal bones sexual organs and secondary sexual characters. An exactly similar picture may be elicited in animals by extirpation of the pars anterior as Cushing has shown. It was therefore anticipated that the administration of an excess of the anterior lobe secretion to animals would lead to a condition resembling the clinical pictures of gigantism and acromegaly. Notwithstanding these expectations however as he states those observers who have obtained positive results unite in reporting a decided initial retardation of growth in weight and linear dimensions when anterior lobe tissue is administered to young animals.

Returning to the effects of pituitary tissue upon growth Robertson points out that the subcutaneous administration of anterior lobe emulsion to rats inoculated with Flexner-Johling carcinoma very

markedly accelerates the growth of the neoplasm while an emulsion of other tissue such as liver does not produce any acceleration. On the other hand the administration of emulsified anterior lobe tissue to young mice led to equally marked retardation of growth in weight and linear dimensions between the sixth and twentieth weeks after birth.

The author sought to isolate the growth-controlling principle from the anterior lobe and in doing so he paid particular attention to the lipoids. It was very shortly observed that these glands contained a most notable amount (10 mg per ox pituitary or 0.7 per cent of the fresh anterior lobe tissue) of a lipid which presented very exceptional physical and chemical characteristics being soluble in water to the extent of five per cent, soluble in alcohol and in ether and yet precipitable from alcoholic solution by admixture of a definite proportion of ether containing phosphorus and nitrogen in the proportion of 1 to 4 and yielding inositol on hydrolysis. So peculiar a substance, being present in relatively large amounts necessarily fell under suspicion of being the sought for active agent and the effects of administration amply confirmed this suspicion.

The administration of 4 mg of tethelin per day by mouth to mice from five weeks of age onward, produced a most remarkable change in the velocity and time relations of growth. The effect was similar in kind to that of the administration of pituitary tissue already described, that is initial retardation followed by acceleration, but both effects were exaggerated so greatly as to involve total distortion of the curve of growth the second growth-cycle being enormously prolonged, while the third growth-cycle was abbreviated and accelerated. This quantitative difference was attributable to a difference in dosage. The animals which were fed with pituitary tissue received an eighth of a gram of fresh tissue daily corresponding to a daily dosage of between eight and nine tenths of a milligram of tethelin, or one-fifth of the amount of the growth-controlling principle which was administered daily to the animals which received tethelin.

GEORGE E. BRILBY

Park, E. A.: Extirpation of the Thymus in the Guinea Pig. *J. Exp. Med.* 9:17 xxv 129.

The author divided the higher mammals into three groups according to the situation of the thymus. In the first group the thymus is chiefly or entirely in the thorax, in the second, in both thorax and neck, and in the third in the neck alone.

He finds that the thymus in the guinea pig unlike the thymus in other mammals remains a purely cervical organ and does not possess the accessory lobe derived from the fourth pharyngeal pouch so frequently seen in other species. It would seem to him, therefore as if the guinea pig should be especially adapted for complete extirpation of the thymus. That this is not the case however is shown later.

The operation for the removal of the thyroid in

the guinea pig was conducted under ether anesthesia. As soon as the animals recovered from the operation they appeared to be well. A number of the guinea pigs died a short time after the operation but not as the result of it for the mortality was equally high the author states, among the controls.

The animals were kept under observation for variable lengths of time and were then killed. At autopsy the tissues of the neck of all the thymectomized animals were taken out en masse to be studied in serial section for thymus rests. As the block of tissue was removed from each animal it was turned over on its under surface and first the thyroid then the larynx and trachea were dissected away the former for inner histological study than would otherwise have been possible the latter to facilitate serial section cutting. Great care was taken to carry away with the trachea and thyroid as little other tissue as possible. The conclusions are:

Accessory lobes of thymus derived from the third pharyngeal pouch occurring in close association with the parathyroids from the third pouch were found in serial section of the cervical tissues of eleven out of fourteen guinea pigs and probably would have been found in all fourteen but for a technical error.

It is probable therefore the author believes, that accessory lobes of thymus having this situation and origin are usually present in the guinea pig.

Additional accessory lobes of thymus belonging to but at some distance from the main lobe were also present in several of the animals.

The discovery of these accessory lobes makes it certain that the guinea pig is unsuitable material for complete thymectomy, and probably complete extirpation of the thymus in this animal is rarely if ever accomplished.

The extirpation experiments of previous investigators in the guinea pig the author states must now be regarded as partial extirpations, and their results interpreted in that light. Extirpation of the thymus in the guinea pig produced no changes in the author's experiments.

Study of the serial sections of the cervical tissues of the guinea pig indicated that Ruben's statements regarding the parathyroid derived from the fourth pharyngeal pouch in the guinea pig are correct, that it is much smaller than parathyroid III may be rudimentary and is sometimes absent.

No accessory lobe of thymus was found accompanying the parathyroid from the fourth pouch, a finding also bearing out Ruben's statement that no thymus anlage springs from the fourth pouch in the guinea pig. GEORGE E. BERRY.

RADIOLOGY

Savill, A. X Ray Appearance in Gas Gangrene. *Arch. Radiol. & Electrotherap.* 9:6 xvi 20.

From an analysis of 67 cases at the Scottish Women's Hospital, at Roynamont Savill finds

three distinct types of roentgen evidence of gas bacillus infection and believes roentgen diagnosis of these types is possible. They are classified by

Simple swelling with misty outline, found when bacillus perfringens is the chief organism and is due to the oedema.

Swelling and in addition, a cloudy appearance as if flesh were replaced by dark, woolly clouds, usually due to bacillus perfringens and bacillus sporogenes together.

3 Striated coarse and fine coarse more frequent and with more swelling. The fine dark lines of gas infiltration map out the individual muscles so definitely that the plate resembles a drawing. This is usually associated with the vibrio septique and is rapidly fatal.

The prognosis in Type 1 is good after free drainage is established. In Type 2 where cloudiness indicates deep-seated gas unrecognizable clinically the prognosis is less favorable and, unless amputation or other surgical measures reach the infection to stem its course death ensues. The prognosis in Type 3 is extremely grave. Two cases with fine striation died with rapid massive gangrene. Of 15 cases with coarse striation, 6 died after amputation, 6 lived after amputation and 3 had a tentative removal of gangrenous muscle. D. VAN R. BOWEN.

Morgan, J. D. McGill, C. M., and Vitrondé, G. The X Ray Diagnosis of Gas in the Tissues. *Brit. Med. J.* 9:718.

The authors call attention to the fact that infection of a wound by gas-producing organisms can be detected much earlier by X ray examination than by any other method. By early diagnosis the limbs and probably the lives of many wounded men may be saved. The interpretation of the skiagrams of these cases is by no means easy. Experience and a general consideration of the case will help in arriving at correct diagnosis. The quantity of gas found in the tissues is no criterion of the virulence of the infection. The amount of toxæmia present is the best evidence of the seriousness of the case. The gas may appear as bubbles arranged in strings; it may lay as a clear layer under the skin or between the muscles. It may occur as large irregular spaces or be scattered broadcast throughout the tissues. One must be careful not to mistake normal shadows for gas infection shadows.

Besides being a means of early and definite diagnosis, the X rays give valuable information as to the extent of tissue involved thereby defining the amount of surgical interference necessary.

Case reports are given of nine cases of gas infection in which the skiagrams were of decided advantage in the diagnosis and treatment. G. W. GARR.

Berry, H. M. The Recognition of Gas Within the Tissues. *Pac. Rev. Soc. Med.* 9:6 x, Sect. Electro-Therap. 7.

Gas formation in the tissues following anaerobic infection can be early demonstrated by good radio-

graphs. Its exact location and extent are shown. Sometimes the condition can be recognized by this method before any clinical evidences are manifest.

As early recognition is vital if the disease is to be successfully combated the relative importance of the X ray examination is self-evident.

From an X ray standpoint there are two types of gas formation (1) a small number of discrete bubbles (The individual bubbles may be large or small) (2) extensive and diffuse gas infiltration.

The following conditions may simulate gas infections (1) actual loss of tissue with consequent increased radiotransparency (2) bubbles of air may be trapped within the tissues (3) following the use of hydrogen peroxide in a wound gas bubbles may be left around the track of the wound. These will be present as discrete bubbles and not as a diffuse infiltration. The latter condition practically always means infection.

The author has examined 28 cases of gas infection. The diagnosis is substantiated in all by surgical and bacteriological evidence. In all cases of diffuse infiltration crepitation of the tissues could be felt. Where only a few discrete bubbles were present nothing abnormal could be felt. The odor of the discharge has no significance in the diagnosis of gas infection. There were 2 deaths in the series of 28 cases. In both there was a mixed infection and extensive gas infiltration. In all cases where there was a large amount of gas the bacillus perfringens was found on bacteriological examination.

G W GREEN.

Dachtler H W: Roentgenological Treatment of 534 Cases of Malignant and Other Tumors of the Face. *Am J Roentgenol* 1917 v 590

In the majority of these cases the tumors were upon or about the face and of the total number 47 were cured. Microscopical examination was made in 62 per cent, and while the others were diagnosed from a clinical standpoint only the accuracy of the diagnoses is not to be doubted as they were made by skilled clinicians. The results were usually good from a cosmetic standpoint and especially satisfactory in those cases occurring in or about the orbit. The results in later years have been more satisfactory as it is usual to refer the cases to the roentgenologist for treatment at an earlier stage, and there has been less fear on the part of the patient at the same time there is less tendency to operate. The most favorable position of all these cases seemed to be upon the forehead and one case came under observation that had received fifty odd treatments elsewhere, and could only with some difficulty be persuaded to resume treatment. Eight treatments healed the ulceration and it has not recurred in eight years. The results were especially good upon the chin and upper lip all healed and there has been no recurrence in two years.

The observations regarding cases of epithelioma of the lower lip are interesting. Of 57 cases 52 were clinically cured, and the statement is made that

Unless the glands are already involved, excision and postoperative roentgen treatment will accomplish as favorable results as a radical operation. The author decided to apply roentgen treatment to the lesion as well as to the glands in selected cases. The results have been as favorable as in the earlier cases which had either undergone excision followed by roentgen treatment, or a radical operation alone. His experience in the treatment of lupus has not been so favorable as even in those cases that yielded to treatment recurrence was common. In some cases of leiodid the results were satisfactory. No doubt in the future there will be fewer of these advanced cases of epithelioma of the face, from the fact that they can be healed with so little discomfort to the patient and at the same time the application of caustics and cancer pastes while successful in many cases will yield to roentgentherapy where the results are better in every way. W S NEWCOMER.

Quilby A. J., and W A: X Rays in the Diagnosis and Treatment of Thyroid and Thymus Enlargement. *Med Rec* 917 xci, 13

This article deals with enlargements of both the thyroid and thymus glands because in over two hundred and fifty cases studied by the authors it was found that very frequently both glands were enlarged in the same patient. Enlarged thymus was especially frequent in exophthalmic goiter.

In the case of thyroid enlargements X rays were not very useful in diagnosis except to determine the presence of calcareous deposits. Thymus enlargement however was found to be best diagnosed by the X rays. Several exposures must be made as the gland varies in size and density at different times. It must be differentiated from enlarged heart, enlarged mediastinal glands, aneurism, collapsed lung, abnormally placed organs, cysts, tumors, subcutaneous thyroid, central pneumonia, pleural effusion and bony deformities.

In the treatment of enlarged thyroid there should be careful selection of cases. It is useless to treat cases with calcareous deposits or long standing fibrous degeneration. Exophthalmic goiter is most suitable for X ray treatment especially when accompanied by enlarged thymus. A long-continued treatment with small doses was found more satisfactory than a short treatment with stronger doses.

The treatment of enlarged thymus with X rays is most satisfactory. The size of the dose should be regulated by the age of the patient. Children are more susceptible and show quicker results. When the thyroid also is enlarged, both the thymus and thyroid are exposed at the same time. As surgery of the thymus is accompanied by a high death rate X rays should always first be given a thorough trial.

The authors discuss various filters to protect the skin and consider leather the best. In malignant cases the skin can be disregarded as scar formation is of minor importance compared to the cure of the cancer. In a recent group of fifty three thyroid

thymic cases, an apparatus constructed by the authors for administering a very high potential surging current in conjunction with the X rays and giving a very high penetration, was used with good results. The dangers of X ray dermatitis were considerably decreased and the patient's blood-pressure was beneficially modified.

Although the X rays relieve symptoms in many of these cases it should frequently be accompanied by other modes of treatment. ALFRED H. NOBBERGER

Virengu and Jaugous. The Evolution and Treatment of Infected Osseous Lesions Studied by Radiologic Examination (*Étude sur l'évolution et le traitement des lésions osseuses infectées d'après l'examen radiologique*). *J. de méd.* 9 6 n. 73

The authors present a detailed study of 1 observations of the evolution of infected fractures accompanied by illustrative radiographs.

The study of severe comminuted fractures shows diaphyseal fragments with very irregular section surfaces, or with free or adherent fragments. Mobile adherent fragments have only a slight periosteal attachment and sometimes they are very distant from the site of fracture. Fixed adherences have a firm periosteal attachment and are always close to the diaphyseal extremities. The torn, peripheral periosteal layer is not destroyed except in severe infections.

Radiologic examinations show the condition exactly the diaphyseal extremities with free mobile or fixed fragments. Evolution will show different aspects. In general way quite the opposite from cases of pathologic infection, there is no tendency to the diffusion of infection from the osseous tissue when this infection has an external traumatic origin. If disinfection of the bony tissue is rapidly and completely obtained the bone extremities, with the help of the periosteum make rapid repair without complications. The radiographs show repair by regular callus over an extent of even 5 to 6 cm. and the diaphyseal extremities do not show any alteration of structure. But if disinfection is not obtained or only incompletely or late complications varying from simple fistula to the formation of vast osseous cavities or complete pseudoarthroses may appear. These are due to invasion of the osseous extremities by infection. The osteitic zone suffers a more or less slow destruction but it is limited by a bony zone of defence, hard, compact and condensed. This limits the cavities and assures pseudoarthrosis. It is incapable of repair work and it does not allow peripheral periosteal neoformation. The inflamed periosteum, may even for a long time, show considerable neoformative activity but it is useless. Free fragments are destined to immediate necrosis freely adherent fragments undergo secondary necrosis fixed adherent fragments share in the evolution of the diaphyseal extremities.

Radiologic examination therefore permits us to recognize defective evolution as follows

1 In the vicinity of the diaphyseal extremities

and periosteum extensive, diffuse periostitis with out precise limits the appearance of a bony condensation zone with the disappearance of bony gallery next the compact tissue and medullary cavity

With regard to fragments (excepting those quite separated at a distance) partial or total necrosis, condensation, or the beginning of their sequestration by neighboring neoformation.

3 Therefore practically everything is resolved into a rapid and complete disinfection of the fracture area. Removing too little of the injured tissues does not give disinfection and invites complications. To remove too much invites formation of pseudoarthrosis with great loss of substance and without the hope of spontaneous repair. Free fragments and mobile adherent fragments must be removed as well as the bed periosteum with no interference with fixed adherent fragments nor with the diaphyseal extremities except in so far as to clear them of any ragged bony or periosteal excrescences. Such treatment is possible only after a careful radiologic examination, and this must be checked by repeated examinations during the evolution. But carefully following this procedure will avoid those complications in the course of evolution of fractures which are only too commonly observed. W. A. BRENNAN

MILITARY SURGERY

Gross, G. Gaseous Gangrene; Statistical Documents (*L'angine gazeuse documents statistiques*). *Bull. Acad. méd. Par.* 9 6 n. 1861, 585.

In 706 severe wounds received in the author's ambulance service during the battle of Verdun (March-June 9 6) or cases of diffuse massive gaseous gangrene were observed. Of these, 92 were due to shell wounds the remainder being bullet and shrapnel injuries. Regionally there were 51 lower leg injuries 35 of which were fractures 35 wounds of the thigh, 20 being with fracture 15 arm injuries, 0 being fractures. It is therefore evident that leg injuries are most frequently complicated by gangrenous septicemia. Of the total 101 cases, 36 were wounds of the soft parts alone and 65 were fractures with muscular rupture in 38 of which there were accompanying lesions of the large vessels. Vascular lesions constitute a very important factor in the genesis of gaseous gangrene. The results were as follows:

| | | |
|-----------|---------------|---|
| 101 cases | 44 recoveries | 34 after amputation or disarticulation 10 after wide opening up and ether treatment |
| | 57 deaths | 38 after amputation or disarticulation 19 after multiple deep incisions and opening up |

Of the series, 53 per cent of the upper limb cases and 4 per cent of the lower limb cases recovered

46 per cent of the upper limb and 58 per cent of the lower limb cases died.

The mortality for those operated upon within twelve hours was 4.8 per cent. For those operated upon after thirty-six hours the mortality rose to 26.88 per cent.

The author has excluded from these statistics 24 cases of gaseous abscess. The mortality in these cases was 12.25 per cent. Of these 24 cases 21 occurred in the upper limbs. W. A. BRENNAN.

Weinberg M: Bacteriological and Experimental Researches on Gas Gangrene. *Proc Roy Soc Med* 1916 1x 119.

The author describes two types of gas infection. In the first type the extensive gaseous infiltration with gangrene is the outstanding feature. In the second the local findings are usually slight while the patient is very toxic — apparently overwhelmed with the toxins from the gas producing organisms.

The chief organisms responsible for the occurrence of gas gangrene are *bacillus perfringens* (the bacillus of Welch) *vibrio septique* and *bacillus oedematis*. These were found singly or in groups.

The treatment consists of (1) wide incision or amputation, (2) administration of sera prepared from the three organisms mentioned above. There have been some very encouraging results from the use of the sera. J. H. SKILES.

Ivens M H F: A Clinical Study of Anaerobic Wound Infection; an Analysis of 107 Cases of Gas Gangrene. *Med Press & Circ* 1917 cli 19.

This paper was based on 460 cases of gas infection of which 107 were clinically gas gangrene. The factors of importance in the production of gas gangrene were:

1. The proximity to contaminated soil wounds of the lower limb showing a mortality three times as great as those of the upper though wounds of the upper were more frequent.

2. Shell wounds were six times as frequent in gas gangrene as in ordinary infected wounds.

3. The presence of an infected wound of capote kept up the infection.

4. The interval between the wound and the first surgical intervention insignificant wounds frequently causing fatal results if untreated and severely infected.

5. Early treatment was most important in the prevention of gas gangrene.

6. Vascular lesions were an important factor when due to injury as a remedial measure, such as ligation of great vessels, they were not important. 22 cases with vascular lesions were followed by gangrene in 6 cases only.

7. Sixty per cent of gas infected cases had fractures and 71 per cent of gas gangrene cases.

8. Wounds of the calf trunk, or hip-joint were especially dangerous if deeply seated.

9. Tissue injury had an important influence. Gas abscesses were frequently seen in gas infections at

the site of subcutaneous or near simple fractures in the same case.

10. Intramuscular tension from within or without was a potent aid in the production of gangrene.

11. Joint injuries occurred in 13 per cent of gas infections and in 20 per cent of gas gangrene. They increased the gravity of cases and damaged joints were difficult to immobilize without pressure.

The flora of gas gangrene was usually multiple. *Bacillus perfringens* was present in nearly every case. *Bacillus sporogenes* was present in 41 cases. *Vibrio septique* in 6 cases (several fatal), *Bacillus histolyticus* *Bacillus Hibler IX* and *Bacillus oedematis* were all reported but less frequently. *Streptococci* of a virulent type were present in 59 cases and added to the gravity of the infection. Tetanus occurred in 15 cases, and was demonstrated bacteriologically in cases.

Of 464 cases of gas infection 42 were fatal 25 dying from gas gangrene, 4 with tetanus.

Amputation was considered necessary in advanced cases of gangrene, and was performed 65 times with 48 recoveries by the open method with lateral incisions. When gangrene was limited to groups of muscles or joints excision was performed 41 times with 33 recoveries. Hypertonic salt treatment alone was found to be unsuccessful, but combined with 2.5 per cent carbolic acid gave good results.

J. H. SKILES.

Lardennois G and Baume J: The Malignant Infections of War Wounds by Anaerobic Microbes (Les infections malignes de plaie de guerre par microbes anaerobies). *Presse med* 9 6 p 506.

The authors study of gangrenous infections of war wounds is based on the observation of more than 500 cases of varying degrees of gravity.

The conclusions reached in this study are:

1. The muscular tissue is the location of choice for anaerobic proliferation. Anaerobic infection develops in narrow and deep muscular wounds and is more frequent and more severe in the lower than in the upper limbs.

2. A serious infection may develop even in slight wounds without fracture as well as in the more extensive wounds.

3. A certain degree of mortification of the muscular tissue is produced by the passage of the projectile and the molecular disintegration resulting therefrom.

4. Either the septic vibron or the bacillus perfringens are present in all cases or the two may be associated.

5. These germs are generally alone but in some especially severe and fatal cases they are accompanied by cocci. The association of bacilli plus cocci is a factor of gravity. These cocci are anaerobic streptococci.

6. In the beginning toxins alone pass into the blood producing toxemia. Septicemia is produced later. Sometimes after a surgical intervention has

avoided the danger of anaerobic infection a secondary streptococcal septicæmia develops, which is grave and difficult to control.

7 All the microbes which live as saprophytes on the individual and his clothing increase in virulence when incarcerated in the injured muscular tissues.

8 They digest the muscle and create toxic products they digest the vessels and thus create sanguine suffusions and hemolytic crisis. Gas is a by product of this digestion and may be lacking.

9. The clinical manifestations are malignant localized tumefactions, localized gangrene without gas, localized gangrene with gas, diffuse gaseous gangrene.

The author discusses the details on which these conclusions are based. Wounds of the lower extremities have been observed in 78.5 per cent of the cases as against 5 per cent of injuries of the upper extremity. 35 per cent of the cases were complicated with fractures as against 76.5 per cent without fracture.

Anaerobic infections in the authors' statistics showed a mortality of 5 per cent. 85 per cent have been cured by excision or amputation.

Regarding treatment the authors lay stress on the early excision of injured tissues as the best prophylaxis against gangrene. It is only by wide ablation of the gangrenous tissues that a patient attacked by a gangrenous infection can be saved. It is necessary to destroy the illusion of many operators who still believe that removal of a projectile particles of clothing etc. and drainage will preserve the patient from severe complications. Very often the result has proved the contrary.

Large and free removal is indicated in all cases even when the wound is small. Skin, cellular tissue and attacked muscle must be included, but it should be taken not to remove a muscle in its totality but to leave some fascia to provide for reparation and thus prevent future functional incompetence.

When gangrene is discovered vigorous action is required and the removals may be enormous, but the reparations in such cases are very surprising. Amputations must be the last resort. In the after treatment of such breeches the authors greatly favor heliotherapy.

W. A. BRENNER

CORR. R. The Electromagnet in the Surgery of War (Der Elektromagnet in der Kriegschirurgie) *Zentralblatt für Chir.* 9: 6 N. 44.

There are two methods of employing the electromagnet: (1) the action of the magnet from a distance and (2) the magnetic sound. Both have their indications.

The extraction of a piece of iron by means of magnetic rays from a distance is possible only in those tissues in which the resistance is not greater than the power of the magnet. This however even with the largest of magnets upon the ordinary sized piece of shell fragment is not very great and cannot be compared to the power of the human hand.

Only a few of the tissues of the body are adapted for its action, such as liver, brain, and fatty tissue. Through the freshly shattered masses of cerebral tissue following bullet wounds and the canals caused thereby fragments may be withdrawn even from a depth of 7 to 8 cm. If the necessary precautions are taken such as aseptals, weak magnetic power at first it is doubtless the least damaging procedure in penetrating wounds of the brain. In abdominal surgery this method should prove successful in the extraction of fragments from the large parenchymatous organs.

It would be overestimating the strength of the magnetic attraction to attempt to remove shell fragments through muscles, fascia, or skin. It is entirely useless in removing old fragments encapsulated in scar tissue.

The magnetic sound is most useful in conjunction with a hand magnet but more powerful with a giant magnet. One should have at hand a large number of sounds and choose for each case the thickest and shortest which can be used. This is done not only for the greater strength but also to avoid as much as possible the formation of false passages.

Success depends not so much upon the distance of the magnet as upon the carrying ability of the sound-point which must be brought into direct contact with the fragment. In fragments of the thickest and most mutilating procedures are essential, and the electromagnet is of much value, especially if the sound is first introduced with the aid of the oxygen umbrella through the delicate tissues gently to the fragment and the current then turned on and withdrawn. With the low carrying ability of the sound it is much more likely that the fragment will slip off than that the tissues will be injured. The procedure is very simple in cases in which the fragment lies at the bottom of narrow canals and cannot be grasped with forceps as in the sphenoidal sinuses, antrum and joint cavities. In a few cases of cerebral fragments in which the distant acting magnet failed the sound was successful but this must be used only when the indications are present as fresh cases, definite localization and certainty that the object is iron.

The conclusion is that the use of the electromagnet is confined to a minimal number of surgical cases of war but that in these and especially in brain surgery it is undeniably of great value.

L. A. JUNKER

GUILLAUD P. Wound-surgical Impressions Gained in France (Kriegschirurgische Eindrücke aus Frankreich) *Hæft-Tid* Kjøbenhavn. 9: 6 II, Nos. 7 and 8.

The author discusses his impressions and experiences gained in French hospitals. He visited among others Compiegne the experimental station of Carrel, Montkier and its hospital which admits exclusively thoracic, abdominal, and cranial injuries. Amiens with its special hospital for face and neck injuries. Infection is the dominant factor in military

surgery especially now with the long drawn-out trench warfare. Of the small medium sized and large injuries the small are almost never the medium-sized usually and the large or severe injuries invariably infected. As also in Germany the number of artillery wounds has increased enormously with the trench warfare. The time elapsing between the injury and the beginning of treatment is the important element in the infection of wounds.

The author discusses the disposition of the wounded from the trenches. The wounded are first taken to the *poste de secours* where only severe hemorrhages are checked tracheotomies performed and fractures immobilized. After that the wounded are taken to the *poste de pansement* then to a distributing center. The slightly injured are taken to a hospital near the front. The moderately severe injuries are taken to an evacuation hospital and the severest to the surgical ambulances usually 5 to 10 km from the front. Here all operative procedures can be undertaken. After that the injured are taken to the base hospitals.

At the beginning of the war all injuries were treated very conservatively which later led to very poor results. Antiseptic procedures do not play an important rôle. The expectations of Carrel's method of irrigation with Dakin's fluid were only fulfilled in part.

The important point in the treatment is that the injured person receives medical attention during the first 12 hours and the wound is opened and thoroughly drained. The wounds are cleansed a little quicker by this method but a very complicated apparatus is necessary. Since all wounds are now opened widely the infection is less virulent. Gaudie at Montdidier excises the entrance and exit opening like a malignant tumor to healthy tissue and closes the opening *per primam*. As a novelty the author mentions the fact that Gaudie employs methylene blue solutions with the most striking result that all patients doctors beds and the hospital are blue.

With the exception of a few late cases tetanus was not seen. Collargol and vaccine treatment according to Wright were employed without any special results.

The statistics given the author by Lenche are of interest. Following an attack by the Germans upon a trench the author had among 150 wounded 30 injuries of the head 0 per cent 20 face and neck injuries 13 per cent 8 thoracic wounds 5 per cent 2 abdominal 1 per cent 43 upper extremity 28 per cent 27 lower extremity 18 per cent. Following a French attack there were brought in 38 injuries of the head 17 3 per cent 43 of face and neck 19 per cent 26 of the thorax 11 per cent 4 of the abdomen 1 8 per cent 51 of the upper extremity 23 2 per cent and 57 26 8 per cent of the lower extremity. Among 2,334 injuries Lenche saw 229 head injuries 210 of the face and neck 179 of the thorax and back, 117 of the abdomen and pelvis, 614 of the upper and 601 of the lower extremity.

The author comments on the fact that since the introduction of steel helmets the number of head injuries has increased considerably. He explains this by the fact that before their introduction many of those injured were killed outright. All skull injuries are operated primarily. Special treatment is accorded to injuries of the lower jaw which are immediately referred to special hospitals. Especial mention is made of the flying laparotomy ambulances consisting of 11 automobiles and 15 physicians and which can in two hours set up bar racks and everything necessary.

Quénu reports statistics of Stern showing 300 cases of abdominal wounds treated conservatively with a mortality of 80 per cent and 260 cases treated by operation with a mortality of 60 per cent.

The author saw but few injuries of urinary organs — 2 or 3 bladder injuries. Bone injuries are not treated conservatively as at the beginning of the war. The wounds are opened up loose or easily loosened fragments are removed. The dangers of pseudarthrosis formation is not great.

Considerable difference of opinion exists regarding the treatment of joint injuries but it seems that resection is preferred to the conservative treatment. He saw but few aneurisms and these were treated by ligation. Nerve injuries are common and should be operated upon early. In regard to amputation everywhere there was marked conservatism. Bullets are removed if they produce disturbances and the danger of removal is not too great. He observed an attempt to remove a bullet from the lung producing symptoms only on deep breathing — the patient remained on the table. Two shell fragments were sought in vain in the posterior mediastinum. The methods of localization are the same as ours.

L. A. JENNEX.

Ashford M. The Most Practicable Plan for the Organization Training and Utilization of the Medical Officers of the Medical Reserve Corps of the United States Army and Navy and of the Medical Officers Reserve Corps of the United States Army in Peace and War. *11th Surgeon* 1917 21, 23.

It has been clearly shown by the events of the past two years that the people need only to be shown the necessity for military preparedness when they will themselves demand it. It becomes necessary to determine upon some method by which all reputable doctors may be reached and their interest gained, the plan proposed automatically performing that arduous task. This interest must be aroused through the medium of the medical press the lay press public lectures, and personal affiliations.

Any rational plan for defense must not alone include all types of citizens but must discern their especial talents. Furthermore, such plans must consider that any vital issue between the United States and a first rate world power will compel this nation to equip an army and navy of unprecedented magnitude. With the first 500,000 men would march

the entire trained medical personnel of the nation, while for an army of 5,000,000 men the services of 35,000 medical officers would be required.

The plan that is offered is based upon the principle that all matriculates in reputable medical schools shall be considered by the Government as potential Medical Reserve officers, though it is not proposed to compel medical students to pursue a course of instruction along military lines. The Government shall make to all medical schools the offer of compulsory or optional course in sanitary tactics for their student body, the school to elect whether this shall be a compulsory or a purely optional course. The former will have an officer of the Medical Department of the Army or Navy compensated by the Government detailed as instructor. The latter shall have the same arrangement provided the number of volunteer students is sufficiently large to warrant it.

The reasons for this departure from the present plan are: a course of instruction is most valuable during the formative period when the individual is receiving his medical education; every potential doctor can be reached at this time; this is the period of medical life when the physician can interest himself in military essentials with the least professional or personal sacrifice. This plan verges upon universal military service but any other scheme is a makeshift as true preparedness must be based upon universal service.

The plan of instruction of graduate physicians of the Medical Reserve should be systematic, tend toward organization as well as education, and lead to classification according to special abilities. The course proposed is a four year correspondence course accompanied by a period of not less than fifteen days spent in an annual summer maneuver camp. At the end of the second year of this course those who have complied with the requirements will be invited to take an examination in the subjects which they have studied, the successful candidates being awarded a certificate of eligibility for appointment as captain in the medical section of the Officers Reserve Corps of the Army or as past assistant surgeons in the Medical Reserve Corps of the Navy. A similar examination at the end of the fourth year of the correspondence course will make the successful candidate eligible for the grade of major. The purpose of these examinations is to relieve the Medical Reserve officers from the burden of indefinite periods of preparation for examination to offer them an incentive to successful completion of an arduous course and to enable the Government to possess at all times a systematic classification of qualified Medical Reserve officers.

When the physician has completed this training and is qualified as a Medical Reserve officer it becomes necessary to find a way to hold his interest and keep him in touch with the changes in Medical Department administration. To this end a bulletin shall be prepared quarterly which shall contain all information of interest concerning changes in

the policy in the regulation or in the instructions for medical officers.

Under this system the instruction of the corps will cease to be a haphazard matter but rather make for efficiency, breadth of view and practical success. A plan for a national medical school for the three sister services of the Army, Navy and Public Health has been considered, but it is not now practicable.

In order to make the discussion complete a plan of organization from both a military and political viewpoint is presented. A skeletal scheme is outlined in order that the reader will be able to consider the practicability of a national association. This association will meet annually at the time and place of meeting of the American Medical Association. Its prime purpose being to foster patriotism and preparedness for war service among American medical men and to strive for the best interests of the corps. It will have a national council whose membership will be based upon one delegate for every state in the Union.

The state associations will meet annually the purpose being to foster the State Medical Reserve Corps by word and example. The state associations will elect delegates to attend the annual meeting of the association of the American Medical Reserve Corps. The state association is the primary unit in national organization and every member practicing in the state has the privilege of voice or vote in its proceedings. For any other purpose than political reservations in cities or any densely populated communities may organize clubs or societies.

The military organization may be diagrammed schematically as follows:

Medical cadets (third and fourth year medical student) under military instruction.

1. Commissioned officers, Medical Reserve Corps.
 - (a) First lieutenants, M. R. C. U. S. Army or assistant surgeons, U. S. Navy.
 - (b) Captains, M. R. C. U. S. Army or passed assistant surgeons, U. S. Navy.
 - (c) Majors, M. R. C. U. S. Army or surgeons, U. S. Navy.
 - (d) Majors, Consulting Surgeons.
2. Retired officers, Medical Reserve Corps.
 - (a) Retired from field service.
 - (b) Wholly retired.

Acceptance of existing conditions in the Army make it obligatory to assume that subsequent to the initial advance of certain Medical Reserve officers to conform to the prescribed ratio in each grade, advancement in peace and war in the Army Medical Reserve Corps must be by filling vacancies rather than by stated period in each grade. It is also necessary to assume similar legislation for the Navy. As a solution of the difficulty as to the rank and grade of Medical Reserve officers on active duty it is suggested that the vacancies in each advanced grade be allotted to the active and inactive list of the Reserve Corps in exact ratio to the numerical strength of the two branches of the corps.

Consulting surgeons are those who are regarded as

specialty fitted for the execution of special duties and who will be commissioned in the grade of major when placed in active service and who will be exempt from routine attendance on camps of instruction cruises and like duty.

Officers of the Corps physically disqualified for field service but who wish to be regarded as reserves may be transferred to the limited list and will then be available for service at the base or in home hospitals. Medical officers of national reputation are desired for these special duties. Such selection and designation of specialists is to be supplemented by a card efficiency record for every reserve officer.

The retired list comprises those who have been found physically disqualified for active field duty and who have been retired to a special reserve list and will be expected to meet all requirements for Medical Reserve Officers except that of field or sea duty and those retired wholly because of physical disability or because of age limit prescribed by law.

Any officer who holds a commission in the corps will be liable to military duty when called to the colors and must serve when required by the department. He will be required to equip himself with the individual field equipment of the officer. Reservists graded as consulting surgeons will be assigned in time of war to those places where they may exercise their specialty with maximum efficiency. Those holding the grade of major, captain or lieutenant will be commissioned in their own grade or in an advanced grade according to the needs of the service.

Medical cadets will not be required to forego their medical training in case of war. If they should

volunteer they will be utilized in base or general hospitals as anesthetizers, dressers, etc. They would not be employed in hazardous posts because the demand for doctors becomes so great in times of war that the nation needs increased rather than lessened production.

E. K. ARMISTEAD.

INDUSTRIAL SURGERY

Mock, H. E. *Industrial Medicine and Surgery: the New Specialty*. *J Am M Ass* 97: 1274-1275.

The author gives a very comprehensive outline of the careful work being done along the line of industrial medicine and surgery. Preventive medicine occupies a high place in the scheme outlined. This prevention involves the prevention of accidents, the prevention of the transmission of contagion from one employee to another and the prevention of comparatively mild illnesses in the individual becoming severe ones. First aid is administered at once by a fellow employee in cases of mild injuries but whether the injury is mild or severe all cases are at once sent to the doctor's office for supervision.

A large amount of sociological work must necessarily be done along with the regular medical and surgical duties. Sanitation, ventilation and all matters dealing with the sanitary conditions of the working place make up a large portion of the work. A large field of usefulness also which the conscientious physician may fill, is along the lines of construction in hygiene and methods of living which will benefit not only the individual, but the community at large.

J. H. BRILES.

GYNECOLOGY

UTERUS

Frank, R. T. The Palliative Treatment of Inoperable Carcinoma of the Cervix by Means of Radium. *J. C. R. Soc. N. Y.* 85

The author believes that the technique and application of radium in its range of usefulness the permanency of the relief the histological changes taking place and the process by which the rays produce their effect are questions which are still unsettled and the purpose of this article is to contribute to the various phases of the subject not yet cleared up and to put a record of interesting observations made during the treatment of a small but varied series of cases. From his study he believes that the following conclusions are warranted:

Radium is the best palliative measure in inoperable carcinoma of the cervix, and in advanced cases may be treated with it. It not only rapidly relieves the pain, hemorrhage and discharge but indirectly also improves the general health and condition. The minimum quantity of radium substance needed he says is 50 mg.

Border line cases or operable cases he believes should be submitted to operation after a short preliminary course of radiation and good primary results may then be expected from simple total hysterectomy. Operated cases he states should be subjected to postoperative prophylactic radiation, beginning not later than four weeks after operation. The technique of radium treatment of cervical cancer he considers simple and easy to learn.

He concludes with a word of warning against the building of undue hopes upon this recent addition to the weapons in the fight against cancer. His report of early results obtained agrees in the main with the favorable results reported by many others, and shows that radium is a wonderful palliative but whether the final results will prove that radium can give a permanent cure of cancer he considers still mooted question. Judging from the limited penetrating power of the rays and the variation of resistance of different cancers it seems probable to him that numerous disappointments will occur and that in many cases positive harm will be done by enthusiasts who refuse to submit operable cancers to surgical operation.

GEORGE F. BRILL

Benmosche M. A Contribution to the Study of the Relation of Erosions of the Cervix to Malignant Growths of the Uterus. *Am. J. Surg.* 97, vol.

After reviewing the histology of the cervix and asserting that all epithelial new growths have some

irritative influence as a starting point Benmosche states that the cancerous cell is not a new unit, but an epithelial cell which under the influence of radiocell changes has degenerated and reverted to its ancestral prototype—the unicellular protozoa—the amoeba.

With the reversion to the parental type it acquires all the qualities as well as the defects of the unicellular organism.

The qualities are but one activity rapid proliferation, osmotic.

The defects are disordered growth imperfect organization, precarious existence—reaching the stage of parasitism.

The occurrence of epithelial tumors in old age may be explained by an attempt on the part of an organic cellular unit—the epithelial cell nearing senescence to reproduce its parental prototype and begin anew its life cycle—stimulated by an irritant.

There is great similarity between the cervix and mammary glands. They are both functionally very active in child-bearing women and are also both subject to various forms of injuries, irritations, and inflammatory changes with their sequelae.

Carcinomas frequently follow pre-existing chronic inflammations, usually spoken of as the precancerous stages.

The occurrence is in direct proportion to the duration of the inflammation and the protoplasmic activity of the part affected.

It is important to distinguish between simple erosions and ulcerations of the cervix. No ulceration of the cervix should be looked upon as benign. Every case of laceration and erosion as well as any symptomatic aberration referable to the generative organs of women nearing the menopause should be carefully studied properly diagnosed and radically treated.

In support of this statement a case of a woman 59 years old is reported in whom the clinical picture showed a bilateral laceration of the cervix markedly eroded while the microscopic findings of the amputated cervix were those of an early malignancy.

L. R. GOLDMANN.

Warner F. Malignant Leiomyoma of the Uterus. *Am. J. Obst. N. Y.* 97, 1, 11, 24

After a discussion of fibrous tumors of the uterus illustrated with four microphotographs of tissues the author summarizes his study as follows:

1. Clinically so-called uterine fibroids are leiomyomata.

2. Leiomyomata are derived, as the name indicates, from smooth muscle-cells these newly form

ed cells stimulate the development of fibroblasts with excessive growth of collagen and fibrinogen fibrils from them. The subsequent contraction of the newly formed connective tissue may be such as to largely destroy the muscle-cells giving the growth the appearance of being a true fibroid tumor.

3 The tendency of all leiomyomata is to form in definitely encapsulated areas when numerous cells break through thus encapsulation the growth is suspiciously malignant.

4 About 2 per cent of the cases of leiomyomata are associated with malignancy of a sarcomatous type while carcinoma complicates them in about 4 per cent of the cases.

5 It is dangerous practice to consider all leiomyomata benign many may be found at operation to be associated with malignancy.

6 Sarcoma is a disease of infancy and early childhood in the main leiomyoma occurs most frequently between the third and fourth decades of life.

7 A rapidly growing leiomyoma should excite suspicion of malignancy.

8 A thorough study of leiomyomata subsequent to operation is needed to determine the question of malignancy.

9 To differentiate a leiomyoma from a true fibroid tumor a differential stain, such as phosphotungstic acid is needed to bring out the myofibrils of the muscle-cells as well as the collagen and fibrinogen fibrils of the fibroblasts.

10 Any sort of malignant cells may assume the shape of spindle cells or round cells large or small. Consequently it would be preferable to name the neoplasm sarcoma, fibrosarcoma etc rather than round or spindle-celled sarcoma.

11 Increased flow at the periods is a symptom of leiomyomata but a flow instituting itself between periods points to other causes frequently malignancy.

12 To leave leiomyomata unoperated upon, always exposes the patient to the danger of malignancy engrafting itself upon the growth, if indeed the tumor is not already malignant.

13 The extent and degree of malignancy of a leiomyosarcoma is determined by the extent to which the growth has broken through the capsule the surrounding infiltration, the presence of mitotic figures, the poorly differentiated cell structure and the invasion of lymphatics or lymph-nodes as well as the pinkish appearance of the growth revealed on section.

C. H. DAVIS.

Williams, J. T.: Extrapelvic Causes of Uterine Hemorrhage. *Intern. M. J.* 1917 xxi 173.

From a review of the literature and his own experience, Williams classifies these cases as follows: Those associated with diseases of the blood—*anemia, purpura, leukemia*.

Those associated with circulatory disturbances—*cardiac disease, hypertension, portal stasis*.

Those associated with disturbances of the organs of internal secretion—*thyroid, adrenal, pituitary*.

Those associated with diseases of metabolism—*scurvy, diabetes*.

Those associated with diseases of the nervous system—*hysteria*.

He reports interesting cases due to nephritis, *leukemia*, and heart-disease and reaches these conclusions:

1 All cases of uterine hemorrhage not definitely due to some obvious local cause should be subjected to very thorough general examination before any local treatment is attempted.

2 When some constitutional cause is found, treatment should be directed first to the general condition.

3 If such constitutional treatment fails to stop the hemorrhage, curettage may be resorted to in order to stimulate by mechanical irritation the uterine muscle to contract on the bleeding vessels except in cases of hypertension in which the hemorrhage is usually an attempt on the part of nature to relieve the increased blood-pressure, and therefore should not be checked.

L. R. GOLDSMITH.

Frank, R. T.: A Study of the Anatomy, Pathology and Treatment of Uterine Prolapse, Rectocele, and Cystocele. *Surg. Gynec. & Obst.* 1917 xxv 43.

Vaginal interposition of the uterus for cystocele, and isolated levator suture for rectocele at once enjoyed wide popularity because these operations have a definite anatomical basis. Both operations have a limited application and as has been shown, levator suture gives unsatisfactory functional results.

The author endeavors to put vaginal plastic repair upon a firm anatomical foundation similar to that enjoyed by hernia in other regions of the body. Just as in the inguinal region, both fascia and muscles must be utilized in the repair and similarly space must be left for certain structures (in the present instance urethra and vagina) to pass through the reconstructed wall.

The anatomical structures that are used in repair of cystocele are mainly fascial—triangular ligament and pubocervical ligaments ("bladder pillars"). Those used in the repair of rectocele are both muscular and fascial—deep perineus and levator ani muscles together with their fascia (levator and anal fascia triangular ligament). Rectocele anatomically is of three types tears of the perineum (triangular ligament) low rectocele (separation of the levator muscles and tear of the rectal fascia) and high rectocele (either a sliding hernia of the upper part of the rectum or a true hernia through Douglas cul-de-sac). Combinations of all three varieties are encountered.

The technique described does not vary radically from that generally utilized. The vaginal denudation is relegated to its proper use, that of a skin incision. Accurate description of the exposure and recognition of the various structures employed in the repair are given. The bladder is liberated and the bladder pillars are united in front of this

viscus. In low rectocele the unisolated levators are brought together and united with the triangular ligament. In high rectocele the sacro-uterine ligaments, cervix and rectal fascia are drawn together to close the hernial orifice.

A full discussion of the practical details of vaginal plastic repair is contained in the article, which also contains illustrations drawn from anatomical models and from operative findings.

R. Bina, C. R. Indications for Hysterectomy as Shown by One Hundred Cases. *Virg M Semi-M* 1914 9 7 vol. 53

Hysterectomies made up about 8 per cent of the total number of operations performed during a certain period. The types of operation were

| | |
|-----------------|----|
| Supravaginal | 48 |
| Total abdominal | |
| Wertheim | |
| Vaginal | |

It is the author's practice in all types of hysterectomies to remove the ovaries as well as the uterus because the disturbance of the system is less. The effect of the genitourinary organs of women on their general health is not confined to the action of the ovarian secretion alone but is dependent upon the complete menstrual cycle.

The ages in this series ran from 16 to 57 years. Divided into periods they were as follows:

| | |
|--------------------------|----|
| 16 to 24 years inclusive | |
| 25 to 34 years inclusive | 30 |
| 35 to 44 years inclusive | |
| 45 to 54 years inclusive | 60 |
| 55 to 64 years inclusive | |

The causes for operation were as follows:

| | |
|--|-----|
| Fibroids, uncomplicated | 27 |
| Fibroids, complicated (usually with pelvic inflammation) | 18 |
| Chronic metritis (usually with hemorrhage) | |
| Chronic pelvic inflammation | |
| Double ovarian cyst with pelvic inflammation | |
| Decayed cyst, complicated | |
| Ovarian cyst post-menopausal | |
| Carcinoma of cervix | |
| Carcinoma of fundus | |
| Rupture of uterus | |
| Prolapse of uterus | 100 |

Conservatism is essential to successful gynecologic surgery; the object of which is to save and prolong life and restore the patient as far as possible to the enjoyment of a normal and happy existence.

Only those cases should be operated upon in which the indications are absolute and the prospect of insuring good subsequent health reasonably certain. In young women operations should be the last resort. Many of their complaints are induced and the result of faulty conceptions of themselves or of faulty habits.

In chronic pelvic inflammation, it is usually possible to preserve the essential organs of menstruation, the ovaries and uterus and restore the patient to health and comfort.

In double ovarian cysts, neither of the ovaries

can be conserved or any portion of them and, therefore, complete ablation of the organs should be practiced.

In carcinoma of the cervix, where the case is considered operable, the Wertheim operation should always be done. This should be preceded by cauterization by the Percy method. In the two cases of carcinoma of the fundus mentioned, one gave reasonable positive signs, the other was found in a case in which the uterus was removed for a chronic metritis.

In the case of rupture of the uterus, the patient was already infected and running a temperature. Hysterectomy and free drainage resulted in a cure.

While in young women hysterectomy is not an operation of election but only one of necessity, the reverse is true in women about the menopause and in these cases the burden of proof should be to show why such a uterus should be saved.

EDWARD L. CORNELL.

EXTERNAL GENITALIA

Rachford, B. K. Epidemic Vaginitis in Children. *Am J M Sc* 1914 9 7 vol. 507

The author states that while there is little doubt that the large majority of cases of epidemic vaginitis in children are of gonorrheal origin, the bacteriological tests used to differentiate the gonorrheal cases from the others are not absolutely satisfactory.

Vaginitis is now recognized as one of the most prevalent infections, especially in institutions. In the author's experience the large majority come from institutions and occur in children under school age.

Epidemic vaginitis is on the increase and its control presents one of the most difficult of the public health problems. It is remarkable that the disease is so rarely transmitted to adults while it is so extremely infectious among children. Among children the cases due to sexual contact are practically negligible. In adults it rarely is transmitted in any other way.

The duration of the disease according to the Report of American Pediatric Society on Vaginitis in Childhood made in 1913 is from six weeks to six months. One of the physicians believes that cure comes only at puberty. Although recurrences are very liable to occur the disease seems to disappear at puberty. Complications rarely occur. In a very large experience the author has seen only one case of arthritis.

The simplest methods of treatment are to be preferred. The author uses daily irrigations of 2 quarts of normal saline solution followed by an injection of 2 or 3 ounces of a 1 per cent solution of silver nitrate. The danger of reinfection is great. The older children should be excluded from the schools, but this in turn is an injustice as it deprives them of their education.

From a public health standpoint these cases would

be easier handled if they were classed as epidemic vaginitis and the term gonorrhoeal or gonococcal vaginitis dropped
S. A. CHALFANT

Mucha von: The Question of Uterine Disease in Cases of Vulvovaginitis Infantum (Zur Frage der Uteruserkrankung bei Vulvovaginitis Infantum) *Wien med Wchnsch* 1916 No 28

Gonorrhoeal disease among infants has also been increased by the war. The author observed 7 cases of specific vulvovaginitis among which there were 3 cases in which symptoms pointed to the involvement of the uterus and adnexa. A girl 19 months old with gonorrhoeal vaginitis died of scarlet fever. The histological examination showed definite inflammatory and infiltration changes in the vaginal mucosa throughout its entire extent including the mucosa covering the vaginal portion of the cervix to the mucosa of the cervical canal. The bacteriologic examination showed no evidence of the infection going beyond the external os. In addition there were peculiar changes in the epithelium of the cervix consisting in marked hypertrophies of the epithelium. The uterus and adnexa showed no pathological changes whatsoever. The treatment of this condition consists in daily irrigation with 0.25 to 0.5 per cent solution of protargol and 1000 argemum. In the non-specific cases the local treatment is omitted entirely and a general tonic treatment with iron and arsenic instituted
L. A. JONES

Frank, R. T.: Technique of Vaginal Plastic Operation for Cysto-Rectocele and Prolapse of the Uterus. *N. Y. J. Med* 1917 xiv 3

The author has written this paper not as he says with the intention of describing any new operations but with the idea of standardizing operative techniques. The results obtained by the usual operations in the repair of cystocele and rectocele and prolapse of the uterus are ridiculously poor and the author believes this to be due mainly to lack of individualization of technique.

In the operation for repair of cystocele, which is the usual one employed particular attention is called to the musculofibrous strands — the bladder pillars — arising partly from the lateral wall of the cervix and vagina and extending to the bladder. These pillars will be found to be continuous with a firm layer of fascia which must be preserved intact. It is the tensile strength of these pillars with their fascia that is to hold the bladder at a higher level. In passing the sutures a good bight is taken in the cervix so that when tied, they bring the pillars together in front of and attached to the cervix.

The operation for the repair of lacerated perineum should be divided into three stages

1. Repair of rectocele.
2. Repair of perineum
3. Repair of enterocele and high rectocele

For the repair of rectocele the author prefers the Hegar denudation. In bringing the separated

fibers of the muscle together no distinct isolation of the muscle is done but a bight of tissue *en masse* in sufficient bulk to give firm support always including the rectal fascia, is brought together in front of the rectum. When brought together and tied the vaginal canal should admit one or two fingers depending on the conditions sought — subsequent childbearing or not.

For the repair of the perineum this process is continued downward taking good bights of lateral tissue. When these are finally tied a firm perineum will have been built up.

For the repair of high enterocele, after the usual denudation for rectocele, blunt dissection exposes the sacro-uterine ligaments behind the cervix and beginning at this point (sacro-uterine ligaments), which is considerably higher than for the usual rectocele the lateral tissues including the lateral peritoneum ligaments and fascia, are brought together in front of the rectum. The remainder of the operation is the same as for the repair of rectocele given above.

The author believes that by keeping these various detailed points in mind he has not only been able to get better results in his work but he has been able to teach the principles involved with greater ease.

HARVEY B. MATTHEWS.

MISCELLANEOUS

Peterson R. Relationship Between Gynecologic and Neurologic Conditions. *J. Mich. St. M. Soc.* 1917 xvi, 51

It is firmly fixed in the minds of the profession and of the laity that functional nervous diseases in women are caused or at least aggravated by pelvic diseases and treatment of the female genital organ is at once begun no matter whether they are diseased or not.

The author classifies these neurotic women as follows:

1. Women with neurological symptoms whose pelvic organs are anatomically and physiologically normal.
2. Women with neurological symptoms whose genital organs are anatomically normal but whose functions are abnormal.
3. Women with derangements of the nervous system whose pelvic organs are unquestionably diseased and where the disease may aggravate but does not necessarily cause the nervous manifestations.
4. Women of naturally good nervous organizations whose nervous manifestations have followed upon and hence apparently are due to true pelvic lesions.

EDWARD L. CORWELL.

Pilcher J. D. The Action of Several Female Remedies on Strips of the Excised Human Uterus. *Arch. Int. Med.* 1917 xiv, 53

Aletris (unicorn root) pulsatilla, and oil of valerian depressed the activity of strips of the ex-

cised human uterus caulophyllum (blue cohosh) caused tonic contraction, while viburnum prunifolium and cnicus benedictus (blessed thistle) were inactive.

It is highly improbable that these drugs could act on the uterus *in situ* in doses that could be tolerated by the patient. Further the action was in no sense specific to the uterus, so the drugs acted in the same manner on strips of uterus and intestine of the guinea pig.

Manton W. P. Insanity and Pelvic Diseases in Women. *J. Mich. St. M. Soc.* 97 xvi, 49.

The author tabulates 36 cases of psychosis in one table and 100 in another. He does not believe, however, that as a rule the pelvic condition has anything to do with the type of the associated psychosis. In the first table the percentage of cases in which pelvic disease was found was 68 while in the second list it happened to be 100 total which would not often occur as 8 per cent fairly represents the frequency in cases which have come under his observation.

Insane women suffering from pelvic disorders from a humanitarian point of view at least are entitled to any and every form of treatment which will lessen local irritation and relieve somatic suffering.

EDWARD L. CORNWELL

Serafini. Experimental Researches on Utero-Ovarian Irradiation by X Rays. *Radial Med.* 9 6 lii, 69.

Although there have been many publications describing the effect of X rays on the ovary few have appeared regarding the effects on the uterus. The question is important owing to the radiological treatment of uterine tumors and the author has therefore endeavored to determine experimentally the reaction of the female genital apparatus in rabbit submitted to a series of irradiations. The animals were divided into four groups: (1) with ablation of ovary without radiation; (2) normal and no radiation; (3) ovary ablation with radiation; (4) normal with radiation.

From a microscopical point of view the results on the uterus have been as follows. Simple castration without radiation causes a uterine atrophy much more marked than ablation followed by radiation. Radiation of the normal uterus provokes a considerable hypertrophy of the organ compared with non-radiated animals. Histologically in simple castration the muscular layer is but slightly modified; vascularization is reduced. The mucosa is exceedingly modified. In castrated animals submitted to radiation the muscular layer is almost normal but there is a clear connective infiltration. In normal radiated animals there is considerable hypertrophy of the muscle fibers with capillary congestion. The mucosa is hypertrophied.

The general effect of the X rays may be stated thus: there is an important congestion of the whole organ; the germinal epithelium remains intact in the cortical substance; numbers of young and adult follicles some having undergone cystic degeneration. Lutein cells are rare. Interstitial tissue is developed; there are no recent yellow bodies. Radiation acts by inhibition of the ovary; every cell submitted to the action of the rays loses its cytological power but capable of living some time. This fact was clinically verified because radiation of the uterus temporarily suspended menstruation and it caused sterility if the dosage is prolonged sufficiently.

The blunar action of the rays was clinically demonstrated in the case of a woman of 40 who was treated by the rays for uterine fibroma and subsequently had a total hysterectomy. The uterus was found enlarged, hard, congested, and edematous on its anterior face. The ovary showed numerous necrotic spots with hyaline degeneration and total absence of yellow bodies; there was an abundant interstitial hemorrhage which seemed specifically due to the action of the rays as well as to the necrotic foci.

Regarding reaction effects at a distance the authors have observed that castration and radiation of the genital organs produced a hyperactivity of the hypophysis while in the pineal gland there was hypoelectricity.

W. A. BROWN

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Lytle C. C.: Some Mistakes in the Diagnosis of Ectopic Pregnancy. *A J St J Med* 1917, xvii, 33.

Lytle calls attention to the difference of opinion as to the ease of making a diagnosis of ectopic pregnancy before rupture. He compares the diagnosis in the ruptured state to the diagnosis of a ruptured appendix and states that incorrect teaching is the cause for the prevailing idea that the condition is only to be recognized in the ruptured or tragic state. The importance of recognition of the condition is in the difference in the mortality in the case before or after rupture. At the Out Patient Department of Leland Stanford University there was one case of ectopic pregnancy to 131 cases of pregnancy. Williams refers to the evolution of a pathologic curiosity into a condition of every-day occurrence.

Uterine abortion, impending or incomplete is a common diagnosis in cases of ectopic pregnancy before rupture. Of the 90 per cent seen before rupture a large proportion were told that an abortion was threatened or incomplete.

Ectopic pregnancy is frequently diagnosed as acute appendicitis. Ectopic pregnancy should always be considered in abdominal colic in females in whom pregnancy is possible especially with a history of overdue catamenia.

Besides these two conditions, these cases have been diagnosed as acute indigestion gall bladder disease ovarian cyst with twisted pedicle pyosalpinx hydrosalpinx salpingitis, and perforated ulcers.

In conclusion he again emphasizes the fact that the clinical picture of tubal pregnancy before rupture must be thoroughly known and he calls attention to the importance of the symptomatology of irregularity of the menses combined with lower quadrant abdominal pain. By a bimanual examination the discovery of a tender doughy broad ligament mass on the same side of the uterus as the pain adds to the certainty of the diagnosis. Faintness is sometimes experienced before rupture and fever is the rule after extravasation of blood into the abdominal cavity.

McPherson R.: The Conservative Treatment of Eclampsia. *Bull Lying-In Hosp* N Y 1917, xl 48.

McPherson states that originally he was not in favor of the conservative treatment of eclampsia as demonstrated by a paper published by him in 1909, but that in more recent years he has hit the trail for conservatism.

In the article referred to above there was a maternal mortality of 30.8 to 33 per cent and a fetal mortality of 44 per cent.

In 1915 the author instituted the so-called rotunda treatment, and in a series of 35 cases had a maternal mortality of 8.6 per cent and a fetal mortality of 40 per cent.

The rotunda treatment briefly is as follows:

Upon admission the patient is catheterized, the blood pressure taken and put in a dark room. Morphine sulphate gr. 0.5 by hypodermic is given followed by stomach lavage and 2 ounces of castor oil poured down the stomach tube. Colonic irrigation of 5 gallons of 5 per cent glucose solution is given. If the blood-pressure is 175 systolic, phlebotomy is done and a sufficient amount of blood extracted to bring the pressure down to 150 systolic. The patient is then kept quiet and one fourth grain of morphine is given every hour until the respirations drop to 8 per minute. At this time the convulsions have usually ceased labor will have started, and, as has happened in practically all of the author's cases the patient will deliver herself in a short time.

In conclusion the author recommends this form of treatment and believes the men who try it will be convinced of its merits. HANLEY B. MATTHEWS.

Williams, P. F. and Kolmer, J. A.: Complement Fixation in Abortions of Women with Special Reference to the Bacillus Abortus (Bang) and the Bacillus Abortivo-Equinus. *Am J Obst* N Y 9 7 1917.

After a general discussion of the experiments conducted in the course of this study the authors give the following summary of their work:

1. Complement fixation reactions with the polyvalent antigens of bacillus abortus (Bang) and bacillus abortivo-equinus and the sera of 50 women aborting in the early months of pregnancy yielded negative results and indicated that in these cases at least these micro-organisms were not etiologic factors.

2. Since the bacillus of epidemic abortion of cows has been found in milk it is advisable to subject aborting cows to rigid bacteriological and immunological tests for the bacilli before permitting the distribution and consumption of their milk although it has not been definitely proved that the bacillus abortus (Bang) is capable of producing abortion in women.

3. Of these 50 women the sera of only 4 or 8 per cent gave positive Wassermann reactions. Specific treatment of such cases should be continued until the Wassermann reaction becomes persistently

negative not only with an alcoholic extract of syphilitic liver as antigen, but more particularly with a cholesterinized antigen.

4. In conducting the Wassermann reactions with the sera of aborting women it is advisable to use cholesterinized extracts as antigens, on account of their superior antigenic sensitiveness and the likelihood of but small amounts of syphilitic reagin being in the blood.

5. Of these 50 women the sera of 6 or 12 per cent, reacted positively in the gonococcus complement fixation test. It is probable that a larger number were infected with gonococci as the complement fixation test is of limited delicacy. C. H. DAVIS

Rosensohn, M. A Parallel Study of the Blood Pressure, Urine, and Edema in Pregnancy. *Bull. Lying In Hosp. N. Y.* 1917, 53.

A parallel study of the blood-pressure, urine and edema in pregnancy was made, according to Rosensohn with the object of determining whether the edema of pregnancy bore any relationship to nephritis and high blood pressure, or whether the existence of subsequent development of a toxemia could be affirmed by the presence of high blood pressure.

The conclusions which this study warrant are: The edema seen in pregnancy does not necessarily imply the existence of nephritis.

The edema is apparently independent of the blood-pressure.

3. The average systolic pressure in primiparae in the latter months of pregnancy is slightly below normal.

The existence of hypertension does not necessarily imply the development of toxemia.

HARVEY B. M. STEIN

Cornwall, L. H. A Case of So-called Abdominal Pregnancy with Postmortem Report. *Hosp. Bull. Dept. Public Charities N. Y.* 1917, 4.

The patient from whom the specimen was removed died in the Tuberculosis Division of the Metropolitan Hospital on November 6, 1914, the necropsy being performed on the following day. During her stay in the hospital nothing was noted in the physical examination regarding the abdominal condition.

Upon inquiry from friends after her death it was learned that she had visited other hospitals and clinics during her pregnancy. The patient was unmarried. In January, 1913, she was delivered of her first child by cesarean section performed because of eclampsia.

Impregnation occurred on October 10, 1913. The last menstruation occurred on September 1, 1913. During the early months of pregnancy the patient complained of abdominal pains every afternoon, which were so severe as to cause her to go to bed. Early in March, 1914, fetal movements were felt. In the last week of April, 1914, she had very severe

pains in the abdomen, more on the left than on the right side, beginning in the iliac region and extending up the left side of the abdomen. There was no hemorrhage at this time. During the early part of May, she went to a hospital in Manhattan several times, but was told on each visit that it was too early for her delivery.

A few days after her discharge from the hospital she passed some blood while at the toilet. The only description that could be obtained of the blood was that it was thick and black. It is quite probable that the decidua was expelled at this time. After this her menstruation was resumed and it occurred regularly. During the month of May she ceased to feel life. She said that she sometimes felt movements in her abdomen, but there were no kicks and the sensation was different from what it had been before. In June her abdomen began to reduce in size. This diminution in size progressed rapidly until the evidence of an abdominal tumor entirely disappeared.

The necropsy showed extensive tuberculous lesions of both lungs with multiple cavities. The heart showed brown atrophy of the musculature. The liver was in a condition of congestion, with moderate degeneration of the liver-cells. The other organs showed no significant lesions.

Upon opening the abdomen, a tumor mass was encountered, extending from the pelvis to four fingerbreadths above the umbilicus. It was situated between the ascending transverse and descending colon, to which it was attached by a fibrous membrane. The omentum was firmly attached to the anterior surface of the tumor from which it could not be separated. On incising the membrane it was found that the anterior portion of the tumor consisted of the placenta, which measured 18 cm. in its superior inferior diameter and 3 cm. in its lateral diameter. At its center it was 1.5 cm. in thickness and near the edges 3 mm. in thickness, gradually tapering off into the membranes of the sac. The cord was attached eccentrically between the center and the right border of the placenta. The length of the cord was 7 cm. The fetus lay in the sac with the head down in the left occipito-posterior position. The fetus was covered with vernix caseosa. The skin resembled that of a normal child at birth. The inferior portion of the sac was adherent to the fundus of the uterus, but no connection with the uterine or broad ligament could be demonstrated. The posterior wall of the sac was formed by a thin membrane. The tubes, ovaries, and broad ligaments on each side could be demonstrated. The left tube measured 9 cm., the right 7 cm. The right tube was slightly tortuous near its distal extremity but the left was quite normal. The weight of the child was 1,100 grams. The uterus was normal in size, measuring 7.5 by 4 cm. the wall of the body was 7 mm. in thickness. The endometrium of the uterus appeared perfectly normal, no decidua changes being noted. The cervix was small and hard. EDWARD L. CORNWELL.

De Lee, J. B.: Fetal Infection as a Cause of Still Birth and Sundry Obstetric Theories. *Bull. Lying in Hosp. N. Y.* 1917 xl 1

The author is convinced that intra uterine fetal infection is a common cause of stillbirths. He gives the case histories and autopsy findings of 5 cases which substantiate this belief. In the various organs including the blood of these fetuses, there was found in one place or another pathogenic organisms in sufficient number to cause the death of the fetus.

Intra uterine scarlet fever typhoid fever and smallpox have been known for years and therefore reasoning by analogy De Lee believes that any bacteriological disease may be contracted by the fetus *in utero*. The mother may in many instances appear to be free from any infection i. e. the fetus may become diseased independently of its mother.

Intrapartum fever and the so-called physiological chill after delivery may well be manifestations of some form of bacterial infection. Whether the intrapartum fever is due to the absorption of poisons generated by bacteria in the ovum or from the bacteria and their products in the uterine wall or maternal blood really makes no difference. The effect is the same clinically.

De Lee believes that there are three ways by which infection can reach the ovum:

1. By the blood.
2. By contiguity from a neighboring focus e. g. a pus tube, an appendix, an infected fibroid.
3. By wandering upward through the cervix from the vagina or by being pushed up in coitus or in instrumentation.

Furthermore, eclampsia, impetigo herpetiformis, abruptio placentae and acute hemophilia, habitual abortion, nephritis and diabetes and perhaps many other pathological states during pregnancy may be due to infectious organisms or their products.

The author states that in the future no autopsy on a new born child should be considered complete without a careful bacteriologic study of all of its organs including the placenta.

HARVEY B. MATTHEWS.

LABOR AND ITS COMPLICATIONS

Rongy A. J.: The Treatment of Contracted Pelvis with Special Reference to Pubiotomy. *Am. J. Obst. N. Y.* 1917 lxxv 208.

After a general discussion of the subject the author gives 28 case reports in abstract and summarizes his views on the treatment of contracted pelvis as follows:

1. All primiparae must be carefully watched for disproportion of fetal head and pelvis from the thirty-sixth week of pregnancy. As soon as signs of disproportion appear labor should be induced.
2. Pregnancy should not be allowed to go to a possible dystocia nearly 25 per cent of these infants die during labor.
3. Induction of labor after the thirty-sixth week

of pregnancy is comparatively safe for both mother and child.

4. High forceps has no place in modern obstetrics. It should never be used in primiparae. In multiparae who suffer from simple flat pelvis it may be occasionally tried.

5. Craniotomy should not be performed on a fully viable child. It should only be done in cases in which the child is dead or dying.

6. In cases which were misjudged or neglected and the child is still fully viable, pubiotomy is the operation of choice. Cesarean section in such cases must be eliminated because of presupposed infection.

7. Pubiotomy and cesarean section never compete. One is an emergency operation, the other one of election. The mortality rate of the mother in pubiotomy is 3 per cent. Should cesarean section be performed in these cases the mortality rate of the mother would be over 20 per cent.

8. Pubiotomy should never be performed when the disproportion between the fetal head and pelvis is too great. Injury to the sacro-iliac joint will occur if the separation of the cut ends of the bone is more than 5 to 6 cm.

9. The gigli saw may be used as a prophylactic measure in cases of breech extraction in which some difficulty is expected in the delivery of the head. Should it be found necessary the bone can be quickly severed in order to permit the head to pass through. C. H. DAVIS.

Moore, S. E.: Rectal vs. Vaginal Examination in Labor. *Am. J. Obst. N. Y.* 1917 lxxv 225.

The author discusses the advantages and disadvantages of the rectal examination as compared with the vaginal, stating that he has found the rectal route of value in the following conditions:

1. In conjunction with abdominal palpation in pregnancy and labor and a vaginal examination in pregnancy for diagnostic purposes in parturition.
2. As an adjunct where the vaginal route is employed in labor to avoid numerous investigations by the latter method, to note progress of labor and possibly to discover the cause of delayed labor.

3. To get information concerning a gauze sponge left in the vagina after a perineorrhaphy. The bulging of the sponge is felt in the rectum.

4. To see in the puerperium if the uterus is retrodisplaced as a guide as to early getting out of bed.

5. Routine rectal examination in pregnancy may discover a rectal carcinoma, pedunculated fibroid of the rectum, uterine tumors, abnormalities etc. Cesarean section is indicated in rectal carcinoma as it is harmful to drag a child forcibly past such a tumor.

6. To observe advancement of the head during a pain to note progress of labor.

7. To note whether the placenta after detachment lies in the lower uterine segment or vagina.

8. In delayed labor it is not if the spines of the ischium are prominent

9. After a forceps operation in suspected cases to see if the spines of the ischium or coccyx are fractured.

10. In twilight sleep the rectal route usually causing little disturbance of the patient can be employed to note the progress of the labor.

Using rectal examination combined with abdominal palpation in labor the time for making the primary vaginal examination can be estimated.

Sometimes manual flexion of the head in delayed labor can be slightly corrected, thus helping anterior rotation.

3. Nurses undertaking rectal examinations can more efficiently watch the progress of labor.

The author's conclusions are as follows:

1. Rectal examination neither alone nor when combined merely with abdominal palpation in pregnancy and labor as a substitute for vaginal examination in parturition is not compatible with an intelligent management of childbirth.

2. But the rectal route with abdominal palpation in pregnancy and parturition and the vaginal examination in pregnancy subject to the rule when in doubt resort to the vaginal route can be used by the majority of laborers with out necessitating a vaginal examination during labor. Keep out of the vagina in labor except when absolutely necessary to do otherwise.

3. Do a primary vaginal examination in all cases first seen in labor and in all cases of delayed labor and of course where perineal interference has been indicated.

4. Use the rectal route as an adjunct to a primary vaginal examination, thus avoiding numerous vaginal examinations, which should always be minimized.

5. Do the vaginal examination before rupture of the membranes, the cervix being dilated as diagnosed per rectum, and get the benefit of the autogenous douche of liquor amnii.

6. Rectal examination and abdominal palpation in pregnancy and labor should be made thoroughly taught in medical schools. C. H. DAVIS.

Markoe J. W. Posture in Obstetrics. *Bull. Lw. g. I. H. p. N. Y.* 9, 21.

After a brief survey of the literature dealing with the obstetric chair which dates back to the second century the author gives his views on the usefulness of the sitting posture, i.e. the obstetric chair.

The conservation of the woman's energy is the duty of every obstetrician and with the obstetric chair this may be accomplished to a considerable extent, and at the same time the preparation of the soft parts may be more thoroughly completed.

In 20 per cent of the 26 cases in which the author used the chair labor was terminated spontaneously in one hour or less from the time the patient took the sitting posture. In 56 primiparae with abnormal pelvis 37 per cent delivered sponta-

neously by the use of the obstetric chair. The average time in the chair for this group was two and one-half hours. In 23 multiparae with R. O. P. positions 50 per cent delivered spontaneously by the use of the chair. Likewise, in 58 cases of abnormal presentation, including R. O. P. L. O. P. breech transverse, L. M. P. etc. 55 per cent delivered spontaneously.

From this study Markoe unhesitatingly recommends the use of the obstetric chair for the test of labor where there is reason to believe delivery may be accomplished by natural means. Used with discretion many cases will terminate spontaneously which might have otherwise been delivered by operative procedures.

There are a number of tables showing in concise form the data from which the author's conclusions are drawn. HARVEY B. MATTHEWS.

Davis, E. P. Painless Childbirth. *Therap. Gaz.* 9, 7th, 77.

So long as labor has been intelligently studied, efforts have been made to lessen the suffering which attends childbirth. Since the early use of crude opium, chloral hydrate, cocaine and other drugs have been tried. Although its use was objected to by the clergy until Queen Victoria replied that the ecclesiastical who promulgated this doctrine had never borne a child, chloroform and ether have been used ever since their introduction by Sir James Y. Simpson. More recently the method of nerve blocking has been utilized by bilateral injection of the perineum.

A distinction should be made between labor pains and the suffering incident to parturition. The phrase labor pains refers to uterine contractions and it is interesting to observe that in a spontaneous and almost natural birth that severe uterine contractions affect the heart scarcely at all. The sympathetic nervous system does not seem to be extensively involved in this process. The suffering of parturition depends upon the sensitiveness of the brain and cord and not necessarily upon the uterine contractions. This is seen in the different degree of suffering of the highly sensitive society woman and that of the sound vigorous peasant woman. The psychical influences which should prepare the mind of the patient for spontaneous and successful labor are too often overlooked. An atmosphere of hope, cheerfulness and kindness should surround the expectant mother. Forebodings and unnatural fear often have a physical cause and their occurrence should lead to a thorough physical examination of the patient. She should be assured that she will receive the time of labor every assistance and every care to avoid suffering.

Of the methods of relieving pain which have been popularized within recent years, twilight sleep and the nitrous oxide-oxygen analgesia, the author says in substance that regarding the first very little need be said. At present the popular agitation concerning the method has entirely subsided. It is recog-

nized that to be successful the method must be used under the ideal surroundings as described by those who have used it most successfully abroad. Practical experience with this method has failed to make it an established and routine practice in the best obstetrical clinics of the United States. In private practice the author has given nitrous oxide and oxygen a fair trial administered by a skilled anesthetist. In some cases in which it was desired to induce labor or to perform abortions or some manipulation which might be painful but not prolonged nitrous oxide and oxygen given skillfully have been useful but private patients who have in former labors taken ether and in later confinements have been given nitrous oxide and oxygen have expressed their dissatisfaction with the latter method.

Strictly speaking painless childbirth is very difficult or practically impossible except in cases of elective operations where the patient is delivered without labor. During labor the general principle true in surgery is especially true in obstetrics. Safe anesthesia is only possible when the anesthetic whatever it be is given by a skilled anesthetist.

C. H. DAVIS.

MISCELLANEOUS

McNamara S J Symphysis Pubis; Four inch Separation of—Protrusion of Bladder Between Separated Bone—Ankylosis of Sacro-Iliac Joints Failure of Postural and Supportive Measures; Restoration of Pelvic Girdle by Wiring Through Obturator Foramen *Hosp Bull Dept Public Charities* 1917 1 77

The author reports the case of a woman the mother of six children, who was of small stature and inclined to corpulency. She had been attended by the same physician in all six confinements the last one being instrumental. She found she was not able to get around after the last confinement being unable to walk without pushing a chair in front of her. She was told she had spinal trouble but that she would eventually recover from it.

Six months after the last delivery she was taken with severe pains in the right side and was removed to the hospital where she was operated upon as an acute gall bladder case. When it was time for her to leave the bed it was found that she could not walk and an examination showed a separation of the symphysis pubis to the extent of four inches with a fluctuating tumor between the separated bones which was found to be bladder.

Postural treatments of various kinds were used, but the patient complained so bitterly that they had to be discontinued. Compression by various appliances including the support of a plaster-of-Paris girdle was tried but with no success. A stout pig skin girdle reinforced and shaped to her hips was put on and she was allowed to go home. At no time could the separated ends of the bones be brought near enough together to hope for union, even though a device could be found to hold them there, therefore it was decided to bring the bones together by surgical means.

A crescentic incision about seven inches long was made exposing the space between the separated ends and mostly by blunt dissection the separated ends of the joint were exposed. The patient being in the elevated lithotomy position, a catheter was placed in the bladder because of the unusual distortion of the urethra and displacement of the bladder.

The field of operation was enlarged by a longitudinal incision downward. An attempt was here made to bring the separated joint together by two assistants making lateral pressure. No appreciable approximation was reached by this method.

The patient was turned on the side and one of the assistants with all his weight and strength and a jumpy jerky motion finally after some minutes succeeded in breaking up the adhesions that had formed at the sacro-iliac joint thus allowing the separated symphysis to come together.

The patient was replaced in the dorsal position and with one finger behind the pelvic bone the obturator foramen was located on the patient's left and a gigli needle was passed on the finger followed by a carrier and No. 12 silver wire was carried over to the right side and passed from within

PUERPERIUM AND ITS COMPLICATIONS

Markoe, J W: Ureteral Fistula Following Labor Left Ureter Transplanted into Bladder *Bull Lying In Hosp N Y* 1917 21 41

In 100,000 cases of labor at the Lying In Hospital, New York City there has not been a single case of ureteral fistula recorded. Thus Markoe believes is sufficient evidence that such a condition is of extremely rare occurrence. Skene in 1890 thought that injury to the ureters was a common accident but that very few such accidents were ever recognized.

The ureters are most often injured by forceps, version or when undue lateral motion is made during extraction.

The author's case was a III para aged 28 who after having been in labor seventy-two hours was brought into his service at the New York Lying In Hospital and delivered spontaneously of a dead child. Forceps had been unsuccessfully applied at home. Shortly after confinement urine began to dribble from the vagina. Upon examination there was thought to be present a vesicovaginal fistula and an operation for this was attempted. In a short time urine again leaked through the vagina. At this time a diagnosis of probable ureteral fistula was made and laparotomy advised and accepted. The left ureter was found greatly distended from the kidney down to the bladder. It was dissected out of its bed, drained of its contents and the distal end implanted high in the posterior wall of the bladder. The patient made an uninterrupted and complete recovery and has remained so up to the present time.

HARVEY B. MATTHEWS.

out and brought together in front and slowly twisted, assisted at each twist by lateral compression. Particular attention was given to see that the bladder and urethra were not injured either by the compression or by the suture.

As the separated ends came closer and closer together the twisting of the wire became more difficult chiefly for two reasons: first, the receding oblique surface of the symphysis, and, second, the great strain of the silver wire as evidenced by the great force necessary to twist it. The wire was twisted until the bones were in contact the ends of the symphysis having been previously curetted.

Feeling that this single suture did not fulfill all the requirement for fixation of the pelvic girdle two single Lane plates, one screw in each end, were placed across the symphysis and the wound closed, leaving a small gutta percha drain in each angle.

A rapid and complete convalescence was made. Healing was per primam throughout except at the site of the drain which continued to discharge a serosanguinolent fluid of small quantity which was later found to be due to a small piece of the gutta percha drain that became separated and kept up the irritation. About 18 months she was able to walk again.

EDWARD L. CORNELL

Davis, M. M. Jr. The Beneficial Results of Prenatal Work. *Boston M. J.* 1914, 97, 415

Davis summarizes the results of the prenatal work done in certain wards of Boston during 1914.

The work included (1) proper medical examination of pregnant women, pelvimetry to decide whether normal delivery is likely and giving advice particularly when hospital care or operation seemed necessary (2) visits from a trained nurse to the patient with instructions to both parents in the hygiene of pregnancy and reports to the physician (3) expert medical care of confinement (4) frequent visits from the nurse for two weeks more following confinement.

The nurses of the Instructive District Nursing Association of Boston now care for over two thousand cases annually. This is about one-tenth of all the births in Boston. The number of pregnant women coming under this service is increasing annually; they also come for observation at earlier periods of pregnancy.

The medical care is given to some extent by private physicians but mostly by organized agencies. Ninety-six per cent of the women were confined at home.

Prior to confinement the nurse's visits were at about 10-day intervals.

A comparison of the death-rates of 73 babies for 1914 and 1915 shows a reduction in the death rate of one half or one-third among babies receiving prenatal care. The control figures were taken in the same wards and during the same periods, of babies where there had been no prenatal care.

A reduction in the death rate was noted in babies during the first week, month and year of life.

The proportion of still births, each year was only half of that among the general population.

L. R. GOLDSMITH.

Moore, S. G. The Need for Improvement in the Care of Pregnant Women and a Direct Means to That End. *Proc. Roy. Soc. Med.* 1916, Sect. Obst. & G., 37

A voluntary system of notification of pregnancy has been in operation in Huddersfield, England, since January 1906. A fee of 2s. 6d. is paid to the doctor or midwife (not to others) for each notification, subject to the consent of the woman having been obtained beforehand. Each case is visited by a duly qualified and legally registered medical practitioner. No treatment is undertaken. Suitability cases are referred to the family doctor. Maternal aid is obtained from philanthropic persons or organizations wherever necessary. It is not furnished by the sanitary authority. The experience is as follows:

| Period January to October | 1916 |
|-----------------------------------|-------|
| Number of births notified | 1,119 |
| Number of pregnancies notified | 126 |
| Percentage of still | 26 |
| Notified by doctors | 8 |
| Notified by midwives | 18 |
| Number of miscarriages notified | 30 |
| Number of complicated pregnancies | 30 |
| Percentage of complicated cases | 26 |

| Type of Complications | % |
|-----------------------|---|
| Laboriousness | 1 |
| Extreme nervous | 6 |
| Excessive vomiting | 1 |
| Abnormal symptoms | 1 |
| Painless | 1 |
| Severe discomfort | 1 |
| Hemorrhoids | 1 |
| Contracted pelvis | 1 |
| Deformities | 1 |
| Prolapse of uterus | 1 |
| Septic | 1 |

Under certain conditions which are sane and reasonable and will be agreed to by everyone, namely, that on receipt of notification of pregnancy if the woman be visited or examined at all she shall be visited and examined by a duly qualified and legally registered medical practitioner and secondly given that no treatment shall be afforded by the sanitary authority that it confine itself to its true function, the prevention of disease and death but that each case be referred for treatment to the family doctor the above sees no reason whatever why the profession of medicine should not accept generally willingly and cordially the proposition for the notification of pregnancy.

EDWARD L. CORNELL

Jonh, L. F. de A Rare Case of Pedunculated Placenta (Utero raro placenta pedunculada). *Rev. Med. y Ciruj. Habana.* 1917, 17, 111

De Jongh reports a rare case which he terms pedunculated placenta. The patient was an VIII para who had had placental troubles in almost all her pregnancies.

The placenta in the last labor could not be re-

moved by ordinary methods. It was loosened around its margin but in the right side of the uterus there was a resistant point which was difficult to overcome. This point having been examined no adhesions were found. De Jongh made slight traction on the placenta and on the cord and examination led him to believe that the uterine mucosa was prolonged to the placenta forming a kind of peduncle.

The placenta was freed and extracted intact. On examination a small defect containing calcareous deposits was found.

The author considers this case one of a placenta either really pedunculated or a placenta encysted by adhesions to tissues with calcareous degeneration.

W. A. BRENNAN

Barrett L.: The Importance of Linking Up All Organizations for Maternity and Child Welfare in Local Health Districts. *Proc Roy Soc Med* 1916 x *Sect Obst & Gynec* 61.

In all organizations to secure a normal motherhood and infancy, we have to remember that the central factor is the mother and mothers are self-respecting human beings thoroughly British in resenting interference as to the best way of managing their own affairs and particularly sensitive in regard to the subjects with which we are concerned, their homes and their children. The linking up of organizations for maternal and child welfare must therefore, be planned with due regard to the mother her wishes her prejudices and her disabilities for without her co-operation any scheme however excellent is foredoomed to failure. It is true that the mother does not yet know what she needs. So accustomed is she to a maximum of suffering and a minimum of comfort that she does not dream it possible that even the luxury of having time to be ill could ever come her way.

The author discusses very briefly first the need of the mother—medical, educational and social and, second, existing organizations in order to clear the way for some suggestions in regard to (third) co-ordination.

Every practitioner in the district would be invited to send cases of illness in pregnancy or after the lying in period to the hospital for consultation or an opinion, which should be written to him (if unable to meet for consultation) together with any necessary pathological report.

Any practitioner in difficulty during labor might send to the maternity department of the hospital for assistance for or admission to the beds of the hospital.

Any practitioner might send material for exam-

ination or patients for the Wassermann or other reactions to the Obstetric Pathology Department, a report of which should be given. The cost of such outside work would naturally be paid by the Public Health Authorities.

With regard to the question whether general practitioners or whole time officers are to do the work at the small centers it may be pointed out that it would not tend to win the confidence of the women if a succession of different doctors attended the clinic nor would it tend to efficient work. If the general practitioners practicing midwifery in the district would elect one of their number to do this work this grave difficulty would be avoided, though in most districts it might be thought that this would give the chosen medical officer an unfair advantage over his fellow practitioners. If so the difficulty would probably best be solved by the appointment of a whole time medical officer. EDWARD L. CORNELL.

Leavitt F. F. Obstetrics as Practiced in the Country. *St Paul M J* 1916 viii 369.

This paper is a résumé of answers received from 84 physicians to a questionnaire.

Maternity patients are rarely examined during pregnancy.

Taken collectively the country doctor uses the forceps in 15 per cent of his cases. Individually the practice varies greatly. One physician reports that he delivers 95 per cent of his women with them; this is one extreme. Many bear witness that since puerperal extract came into use instrumental deliveries have become less frequent.

Only fourteen say they do not operate without skilled assistance.

There is no procedure in obstetrics that is practiced with such uniformity as the administration of chloroform and ether. Of the two chloroform is the more popular.

Fully one-half of the doctors do not use other narcotics.

In 7,925 confinements there were 211 stillbirths, a rate of 37.5 to the thousand.

Taking those who employed forceps in 50 per cent or more of their cases of whom there were five it is found that 18 stillbirths in 500 deliveries are recorded, a percentage of 3.6. Comparing these figures with those at the other extreme where forceps were used not to exceed twice in 100 deliveries, it is found that 10,600 births only 9 were stillborn or 1 per cent. Take another perspective. In 3,500 labors where forceps were employed in from 10 to 25 per cent of the cases there were 140 stillbirths, or 2.5 per cent. EDWARD L. CORNELL.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY AND URETER

Picquet Partial Nephrectomy for Kidney Wound
Due to War Projectil (Nephrectomie partielle
pour plaie du rein par projectile de guerre) *Bull
Mém Soc Ch Ch P* 9 6 xix, 30 3

The case reported by Picquet concerned a partial nephrectomy made on account of a kidney infarct consecutive to a bullet wound. The projectile had traversed the kidney and the patient who had shown signs of internal hemorrhage but without peritoneal reaction, was treated expectantly for eight days. On the appearance of signs of a secondary hemorrhage Picquet operated by the lumbar route and found about the level of the inferior pole of the kidney a dense mass resembling a tumor which was considered to be the source of the hematuria and resected. Recovery occurred without complication.

In this case it was unquestionably a matter of hematuria consecutive to the formation of an infarct. These hematurias are usually very rebellious and are usually controlled only by a total nephrectomy but in this case partial nephrectomy gave an excellent result. W A BUCKNER

Pirondini E. Contribution to the Study of the Value of Ureteral Catheterization (Contributo allo studio del valore del cateterismo ureterale) *Pel I Roma*, 9 6 xvi et chir 33

From his study Pirondini reaches the following conclusions:

Ureteral catheterization and especially catheterization of the two ureters is the preferable method of urine separation.

But separation of the urine by ureteral catheterization may be disturbed, owing to errors depending either upon incomplete functioning of the catheters the damaging effect of these on the urinary passages or upon unfavorable general conditions of the patient.

Such causes of error may profoundly disturb the deductions regarding the absolute functional value and the comparative functional value. On this account no method of functional examination will perhaps ever completely resolve the problem of absolute functional values.

Accurate appraisal of the compared renal function requires that every statement of urinary separation by ureteral catheterization should have the causes of error as far as known, clearly exposed.

The frequency the multiplicity and the importance of the causes of error require the co-operation of the patient with the view of discovering them and eventually remedying them.

5 While ureteral catheterization may be possible it may be insufficient. Its impossibility or insufficiency almost always notably complicates the solution of the therapeutic problem. In either case it will be useful to have recourse to double exploratory lumbarotomy. Renal massage as a method of urinary separation has a very limited value as a means of provoking unilateral polyuria. It has no value. W A BUCKNER

BLADDER, URETHRA, AND PENIS

Newman D. Residual Urine in the Senile Bladder with Special Reference to the Conduct of the Case so as to Postpone or Avoid the Use of the Catheter. *GT per M J* 9 7

In senile bladder insufficiency of residual urine is of primary importance. It may be present without prostatic hypertrophy. Guthrie in 1830 was the first to describe the bar formation *prostatismus prostaticus* of Guyon, describing accurately the symptoms. But in the greater number of cases of residual urine prostatic hypertrophy is the cause. This type is subdivided into the "quiet bladder" which is infected and the "irritable bladder" which is infected.

The author then describes his conception of the physiology of micturition, and its effects upon the muscular fibers of the bladder so that urination without a catheter can be better understood. Sensory stimuli are conducted to the sensorium when the bladder mucosa is distended. The muscle fibers contract and the internal sphincter is inhibited. By repeated observations with an evacuating cystoscope it was observed that the mucous membrane of the lower posterior wall was first thrown into folds, the waves of contraction spreading upward and forward, the floor being elevated and brought forward. The lateral walls approximated one another. The anterior wall contracted last and only when the bladder was nearly empty. The accepted view is that the muscle fibers at the base of the prostate contract on a vertical axis thus approximating the walls in the middle forming a T.

In prostatic obstructions when the bladder is nearly empty the outlet is closed by the projection of the middle lobe or by the bar against the anterior wall. After the first attempt to empty the bladder has been made and the neck is occluded, after a few minutes rest a second effort is made. The contraction takes place again but before the obstruction is formed part or all of the residual urine is passed. If necessary a third attempt is made. In one patient with a quiet bladder the residual urine was reduced from four ounces to one ounce in six weeks.

In increasing obstruction irritation and frequency become more pronounced in the presence of an infection, especially at night. At night the mind is more conscious of bladder trouble. The ureters and pelvis may be dilated and hydronephrosis occurs. During the day the enlarged kidneys will be displaced downward, twisting and blocking the ureters. At night the ureters open and the relieved kidneys become more active.

Unless the growth interferes with the vesicle out let serious trouble may be postponed for years. Both lobes may be hypertrophied without trouble but a small hypertrophied middle lobe or a bar is serious. In general enlargement dribbling results due to loss of muscle tone in the bladder and urethra and to intravesical pressure. In the quiet bladder atrophy is the rule. Its seriousness may not be recognized until retention occurs or it becomes infected.

In the quiet bladder the wall is thin but in the irritable bladder it is thick and contracted from inflammation and muscular hypertrophy. Sacculi form between the ridges of muscle bands. Unless sacculi form there is little residual urine. Toxemia may result from stagnant urine in the sacculi. Stones may form any acute disease such as pneumonia may cause complete obstruction in either the quiet or irritable bladder. In either the hypertrophy or bar formation. C D PICKRELL.

Schwarz, O. Disturbance of the Bladder Functions After Gunshot Injuries of the Spinal Cord (Störungen der Blasenfunktion nach Schussverletzungen des Rückenmarks). *Mitt. d. Grenzgeb. d. Med. u. Chir.* 1910 xix No. 2.

Schwarz studied the disturbance of bladder function in 43 gunshot injuries of the spinal cord. The sensibility of the vesical mucous membrane was seldom disturbed. The detrusor capability was preserved as established by manometric testing of the artificially or naturally filled bladder. The most constant disturbance in this kind of lesion is the automatism of bladder emptying. This automatic micturition is typical dilatation of the bladder being the stimulus. Permanent urinary dribbling is not observed the time of retention however varies. Residual urine in the bladder was commonly found which could be expressed partly but never completely by external pressure. The detrusor action was usually hypertonic in only one case was a hypotonic condition noted. Sphincter spasm was only temporarily observed. Complete retention immediately after injury is probably due to temporary hypotony of the detrusors and loss of the relaxation of the sphincter. Bladder automatism is due to paralysis of the transverse striated sphincter.

The height of the gunshot lesion in the spinal cord in no way determines the amount of vesical disturbance. The supposition that there is a detrusor or sphincter center in the sacral cord cannot be entertained. W. A. BREXEN.

MISCELLANEOUS

Frank L. Urogenital Tuberculosis Report of a Case. *Urol. & Gynaec. Rev.* 1917 xxi 15

Because of the widely diffused infection and the particular manner in which this case of urogenital tuberculosis was handled, Frank considers it worthy of a report in detail.

The case was that of a male aged thirty-two married eight years who had had typhoid fever five years previous. Venereal infection four teen years previous apparently good recovery. He had been quite a heavy drinker had had a slight cough for the past eight months no expectoration and no pain in the chest.

The present illness began three years ago with painless hematuria moderate in amount but present during each micturition, and persisting for about three months. There was no pollakiuria until one year ago at which time marked pollakiuria began accompanied by pain the urine being usually bloody. He had lost thirty pounds in weight during the last year and had had night sweats for the past two months.

Physical examination showed the heart lungs liver and stomach to be normal abdomen soft flat contained no masses and was not rigid. There was slight tenderness over both kidney areas, most pronounced on the right side. The right epididymus was very much enlarged, hard and nodular the tunica vaginalis apparently contained fluid sufficient to cause the right side of the scrotum to be the size of a small orange.

Urinalysis showed the urine mixed with blood and pus no micro-organisms were found. Cystoscopic examination showed the bladder to be very small capacity one and one half ounces pus with blood coming from the right ureteral orifice urine from the left ureteral orifice apparently clear left ureteral orifice normal. The bladder showed numerous small ulcers one almost completely surrounding the right ureteral ostium. Ureteral catheterization urine from left kidney normal no pus, no blood. The urine from the right kidney contained a large quantity of pus some of which was preserved for guinea pig inoculation. This pig subsequently showed tuberculous adenitis. The diagnosis was tubercular right kidney testicle and bladder.

The first operation performed February 14 1916 consisted in exposure of the right kidney under nitrous-oxide gas and oxygen anesthesia. The incision was made parallel with and one inch below the twelfth rib and extending from the spinal column to a point one inch anterior to the anterior superior spinous process of the ilium. The underlying fascia and muscles were divided, exposing the fatty capsule of the kidney beneath. The capsule along its upper three fourths was densely adherent to the kidney the latter being about the size of a fetal head very soft, and evidently containing large abscesses. The peritoneum was adherent to the kidney and there were several large adherent bands extending from

the kidney, the surrounding fascia and capsule. The major portion of these adhesions were separated. The patient's condition then became such as to preclude any further operative steps, and the enlarged kidney was merely brought into the incision and walled off from the surrounding structures with a cellophane of gauze pads.

The second operation, performed February 2, 1916, consisted in nephrostomy, cystostomy, or cholecystectomy under nitrous-oxide gas and oxygen anesthesia. A two-inch incision was made in the anterior surface of the right half of the scrotum. The testicle and a very much enlarged and hardened epididymis were delivered through the incision. The cremaster muscle and fascia surrounding the spermatic cord were divided; the cord was freed from the adjacent tissues as far upward as possible within the internal abdominal ring at which point it was transfixed, ligated and divided, and the testicle removed. After ligating several small blood-vessels to control hemorrhage, the incision was closed with catgut.

A two- and one-half-inch incision was then made in the median line of the abdomen, beginning at the pubes and extending upward. The muscle and fascia were divided, exposing the bladder beneath. The vesical wall was caught with tenaculum forceps, and the viscous opened. The interior of the bladder was very red, the mucosa showing numerous ulcers. It contained a small amount of pus and necrotic tissue, no calculi. A one-fourth inch rubber tube drain was anchored into the vesical opening by the application of two silkworm gut sutures. The object in draining the bladder by epicystostomy was that its capacity was so diminished, its irritability on account of the ulcers so marked, and the condition of the patient so serious not only because of the disease but his inability to sleep that it was deemed best to place the bladder at complete rest by suprapubic drainage.

The right kidney which at the previous operation had been brought into the incision and surrounded by gauze packs was incised with a cautery knife at two different points which opened into distinct and very large abscess cavities. About one-half pint of foul thick pus escaped. Gauze strips were packed into these cavities, and a large gauze dressing applied. The pathological report showed the specimen to consist of testis 4 x 3 cm. and epididymis 1 cm. in diameter. The globus major was covered with firm, fibrous adhesions, and was bound to the tunica vaginalis by similar adhesions. The entire epididymis was firm and in places showed elevated, circumscribed, pinhead and larger grayish-yellow firm areas. Section showed the epididymis to be grayish-yellow in color and cheesy in consistency. The testis was apparently negative. The diagnosis was tubercular epididymitis, tubercular orchitis.

Nephrectomy was performed March 4, 1916. When the gauze packing which had been placed around the kidney at the previous operation was removed, the capsule of the kidney was found very

thick and densely adherent to the surrounding gauze. The latter was removed, leaving the kidney lying comparatively free in its bed with a space the thickness of the gauze pack giving ample room for all manipulations between the kidney and the surrounding structures. It was particularly noted that the kidney was much smaller than at the previous operation in fact it was decidedly smaller than the normal kidney in size.

A few adhesions on the inner or concave border of the kidney about the hilus required separation. After this had been done the kidney was easily elevated sufficiently to place two clamps in proper position to include the blood vessels and ureter. Division of the tissues was accomplished with the thermocautery. That portion of the kidney pedicle between the vessels was ligated with chromic catgut No. 2. The ureter was then opened, injected with tincture of iodine, ligated with catgut, and released the entire cavity which had contained the kidney was swabbed with iodine gauze strips were loosely packed within the cavity and the incision closed with silkworm gut sutures. The condition of the patient after completion of the operation was very good, his pulse being better than at the beginning.

The pathological report showed a kidney 10 x 6 x 4 cm. Attached to the convex surface near the pole was a granular area, 6 x 3 cm. and from $\frac{1}{2}$ to 1 cm. in thickness, and dark red. This apparently had a distinct, separating grayish-white band, which was not a part of the kidney substance. The remaining portion of the surface was very pale, pinkish-red, and fairly smooth. On section numerous irregular and ragged cavities were seen, the largest measuring 3 cm. in diameter. The walls of all were similar being ragged, irregular pinkish red, mottled, of a grayish yellow flaky substance. Outside of this inner ragged membrane was a grayish white distinct area or zone. Numerous smaller pinhead, grayish-yellow areas were noted. The microscopic diagnosis was renal tuberculosis.

On December 6, 1916, the patient returned for closure of a vesical fistula which had persisted since March, 1916. The bladder capacity was less than an ounce. By treatment the capacity was increased to six ounces. Under gas oxygen anesthesia the upper portion of the suprapubic fistula was excised, a purse-string suture was placed at the base of the area of dissection surrounding the area of fistula, then inverted and the purse-string tied, closing the bladder completely. The patient has had no suprapubic leak since. H. W. E. WALTERS.

Gradwohl, R. B. H. and Scherck, H. J.: A Study of the Chemical Blood Findings in Various Urological Conditions in Comparison with the Phenolsulphonphthalein Output as an Indicator of Operative Risk. *T. Am. Urol. Ass.* Chicago, 1917 April.

The authors present the results of an investigation regarding the usefulness of the newer blood chemical

methods in the estimation of operative risk from the standpoint of kidney function comparing same to the phthalein output. Their aim is to show just what these tests will promise to the practical surgeon i.e. whether they give him any additional information over the routine of special urinary tests whether they tend to disclose any hidden derangements in the kidney function that the physical examination fails to reveal and to what extent they finally differ in the results obtained with the method of dye injection and elimination.

Their material consisted in the main of obstructive conditions of the lower urinary tract in which there was more or less back pressure on the kidneys. Some of these cases suffered from nephritis as well.

They assume that the cause of the severe symptoms in nephritis is impending or advancing uræmia and that the cause of the uræmia is resident in deficient elimination through the kidneys. Whether the ingredients in blood which they are analyzing represent the substances themselves that produce the toxic symptoms or whether they are simply an index of the toxæmia is of little importance for the purpose in hand. The authors believe that they have in an analysis of this kind the surest method of determining by laboratory methods deficiency in kidney function. The estimation of kidney function by determination of the ease and speed with which a chemical dye can be eliminated through them seems somewhat rash in theory and in practice. Because a dye stuff is excreted with a certain degree of ease, it does not follow that the by-products of metabolism are likewise excreted.

The discussion is confined more particularly to the functional test of Geraghty and Rowntree for all of the color producing substances that are used in kidney functional tests it seems to be the most commonly used because of the ease of administration the harmlessness of the procedure and the rapidity of making the test and obtaining the data required. Within certain limitations it gives a fairly good picture of kidney function still it manifestly cannot give the observer the same intimate picture of metabolic processes and real kidney efficiency or deficiency which goes with a complete chemical blood analysis. The work of Folin, Fitz, Frothingham and Denis on the relation between non-protein nitrogen retention and phenolsulphonaphthalein excretion in experimental uranium nephritis, gives a very good view of the exact value of each method of investigation from a purely experimental standpoint. These experiments showed that there was a wide difference in the figures of the phthalein test and the blood chemical data that at the beginning of the nephritis the phenolsulphonaphthalein elimination dropped more rapidly than the accumulation of non protein nitrogen and urea of the blood. During the course of the disease the height of the nitrogenous accumulation is reached from two to three days later than the lowest level of the phenolsulphonaphthalein excretion. Non-protein nitrogen and urea accumulated in the blood and returned to

normal gradually in these rabbits as recovery of the kidney occurred. These observers maintained that in general these two tests paralleled each other but with this essential difference the amount of phenolsulphonaphthalein excretion showed the kidney function at the moment the amount of non protein nitrogen and urea in the blood is rather a measure of an accumulating difference between the amounts of waste nitrogen produced in the metabolism and the amounts eliminated by the kidneys. The time element the duration of the condition constitutes therefore a most important factor in the comparison of these two tests. The phthalein test indicates the function for the moment the blood chemical tests indicate the true grade of the working power of the kidney. These experiments upon rabbits represent the earliest definite comparative tests of these two methods. The conclusions of Folin and his collaborators have been well borne out in practice. We know that there are many cases with little or no phthalein excretion that are badly deficient and show high retention of these non protein nitrogenous blood constituents we know also that there are some cases with decreased phthalein output that are functioning quite well viewed in the light of the non retention of these ingredients of blood we also know that there may be a normal phthalein output and a marked retention of the blood constituents.

These three sets of conditions would therefore cause one to pause in accepting the evidences of kidney function from the phthalein test alone. The author's personal experiences with a comparison of the two methods have forced them to the conclusion that the estimation of kidney function in so far as it interests the urologist cannot be intelligently viewed from the standpoint of operative risk without a survey of the percentage of these blood constituents as well as the phthalein test. They have records showing extensive changes in kidneys without urinary change without change in the phthalein output and yet with very definite retention of urea, uric acid and creatinine. They also have other data showing that in the presence of a rather low phthalein output, kidney function may be unimpaired so far as retention of the non protein nitrogenous constituents is concerned. The points which the authors wish to emphasize from their investigations with blood chemical methods as bearing upon the speciality of surgical urology do not vary much from the conclusions that interest the internists namely that the estimation of kidney function after all is entirely a matter of computation of a number of factors and that the phenolsulphonaphthalein test occupies a subordinate position even when positive and then it is of much more importance than when negative. In other words, as recently pointed out by Beer. The good excretion of substances usually means a good function. Occasionally hyperfunction however may accompany severe diseases and may be very misleading. Foster called attention to the high figures of phthalein

output persons dying from uremia. Unfortunately the investigators who have worked with these various methods, have failed to make sufficiently searching researches upon all the important blood constituents which they are embracing in their present work. They have some cases with mechanical obstruction to the outflow of urine, candidates for operation, with practically normal concentrations of uric acid, urea nitrogen, creatinine, and sugar and yet with very low phthalein output. These cases, according to the authors in no way were in condition of disordered kidney function. They have on record one case of marked stricture with no discoverable physical signs of kidney change which showed high concentration of these ingredients including creatinine figures pointing to impending uremia, even though the clinical condition of the patient at the time of the first blood test was seemingly good. Later on, true to the prediction of the blood findings, this patient lapsed into uremia and dissolution occurred.

The blood chemical analysis shows what the blood is storing up, what the kidneys are doing and what they are not doing, and also the exact status of the trophic and carbohydrate equilibrium.

The authors emphatically deny that the estimation of the presence and percentage of albumin in urine, and even the findings of casts indicate the condition of the kidney for chronic kidney disease and kidney function are not synonymous, by any means. From their experience in this work they believe it to be a valuable addition to their laboratory methods.

Charts were shown by lantern slide illustrating the normal and abnormal findings according to blood chemical methods. These charts show the normal concentrations of the so-called nitrogenous constituents of blood. The last chart shown was a summary of the twenty-four cases studied. It was shown that in a number of cases the blood chemical picture showed up normal ingredients, that the phthalein output was decreased in such cases that the patient was operated upon—disregarding the unfavorable indication for treatment as shown by diminished phthalein output, that the convalescence of the patient was in no way interfered with by deficiency in kidney function. The authors believe, therefore, that the blood chemical examination is a far better proof of the relative manner of action of the kidney function than is the dye test.

It will also be noted that in the first case at the time of this first examination the patient was apparently in excellent condition. He had a stricture of the deep urethra, walking about the hospital. Blood chemistry showed a profound retention of uric acid, urea nitrogen, and especially creatinine, almost 4 mg. They immediately made a prognosis of a serious impairment of kidney function in this case. It is to be noted at this point that he had no elimination of phthalein at this time. Within forty-eight hours this patient went into uremia—his blood condition became worse but his phthalein

output increased to so in two hours. He became steadily worse and died within six weeks. This case illustrated very well the prognostic value of high creatinine retention and at the same time showed the undeniable wavering in the phthalein output—clinical symptoms growing worse, blood picture growing worse, phthalein output growing better. The conclusion from a study of all the figures is that in this group of cases representing cases with back pressure, kidney function is better estimated by blood chemical analyses than by phthalein tests.

Young, H. H. The Relation of Chronic Infections of the Genito-urinary Tract to Obscure Internal Disorders. *N. Y. M. J.* 07 cv 49.

The question of local infections is attracting more and more attention in medicine because of the growing recognition of its importance and the revolutionary advances made in bacteriology during recent years. The source of obscure internal disorders and disturbances of the sexual sphere are being traced to their causes in lesions of the perimontium, prostate and seminal vesicles. The author discusses infections of the genito-urinary system from the various natural points of infection.

Focal infections in the kidney and pelvis very rarely give rise to rheumatism and arthritis, but often to endocarditis and myocarditis. This is explained by the common presence of the bacillus coli in the tract and the supplanting of the more delicate cocci by this secondary invader. Murphy and Kreuzer found the genito-urinary tract to be the source of infection in 4 per cent of 800 cases, cocci were the cause in 58 per cent of the 68 per cent where single organisms predominated.

In overment of the ureter anywhere along its entire length may lead to urinary obstruction, pyelitis, nephritis etc. and the ureter itself may become a flabby dilated tube filled with stagnant infected urine. The author cites two cases of hydro-nephrosis with back pressure destroying a major portion of the kidney function.

Long-standing vesical infection, again with the bacillus coli, the great slender with good drainage and frequent vaccinations cause little trouble. Obstruction however with the consequent formation of trabeculations, pouches, and diverticula gives excellent opportunity for absorption and general infection. Catheter life established before the formation of trabeculations, diverticula, dilatation of the ureters and renal pelvis is compatible with life with only an occasional attack of sepsis after the establishment of tolerance. Adams describes persisting infections or subinfection as the presence of bacteria in the blood which are not potent enough to cause gross symptoms of infection, yet which do wear out the cells whose duty it is to combat with and kill them. The effect of back pressure and infection on the heart blood vessels, and other vital structures gives rise to a desperate condition in the patient. A case report shows the wonder

ful results obtained by systematic catheterization drainage and perineal prostatectomy in a patient with marked cardiac and renal infection, urethra and adnexa Gonorrhea with the consequent infection of this the most complex glandular system to the body in from seventy to ninety per cent of the cases makes the greatest care obligatory in its treatment. Before discharging an acute or chronic gonorrheic the secretion from the prostate and seminal vesicles should always be examined even though the discharge and shreds in the urine are no longer present. The gonococcus disappears quickly to be replaced by other bacteria as shown by Notthast that after three years it cannot be found in the prostatic secretion. Progenic cocci and not the gonococcus or colon bacillus are responsible for chronic infections of the prostate and seminal vesicles and also for the arthritis and rheumatic conditions which so frequently accompany them. There is a possibility here of the mutation of the gonococcus but it would be wise to hold our ultimate decision in this regard in abeyance. Excision and drainage of the prostate and seminal vesicles in the rheumatic and arthritic has worked wonders in restoring helpless invalids to health.

The author believes that there is an internal prostatic secretion affecting the blood pressure and heart and perhaps having an anticoagulative action explaining some of the troublesome hemorrhages from the prostate. He has been using a blood coagulant cephalin with apparent good results.

The verumontanum with its highly complex nerve supply gives rise to severe sexual and urinary symptoms and remarkable referred symptoms. The most common sites for these referred pains in a series of 354 cases were the back 64 perineum 35 suprapubic region, 22 hips 10 thighs 12 knee 4 kidney region, 8 stimulating scrotum in 5 and renal colic in 10. Chronic prostatitis very commonly accompanies verumontanitis and this fact should not be lost sight of. McCrae has called attention to symptoms referred to the heart from focal infections of the prostate and deep urethra.

Prompt surgical treatment of infections of the seminal tract and even its entire removal for tuberculous and other suppurative processes without injury to the urethra bladder or testicle first advocated by the author in 1905 have met with great success and brought another region into the radically curative field of surgery.

H. W. FLAGGMEYER.

Nakagawa, K.: Ambard's Constant and Its Clinical Importance Especially in Urinary Surgery. *B. I. J. S. 72* 917-18 1906.

The author discusses the importance of a determination of Ambard's constant in urinary surgery. A determination of the functional capacity of the

kidneys is of utmost importance to both physician and surgeon. To the former it affords a great help in diagnosis prognosis and the selection of therapeutic measures. The surgeon would be helpless without it for he could not safely remove one kidney without first determining whether or not the other is capable of adapting itself to the new conditions imposed upon it. Furthermore, it is equally essential in surgery of the lower urinary tract to determine the renal function since disastrous results may follow if it is ignored.

Of the many methods of determining the renal function attention is drawn to the fact that since the kidney is a filter inserted into the blood circuit and confronted with the problem of maintaining undisturbed the course of metabolism the rational method should be based on a comparative study of blood and urine. However since the kidneys are not solely responsible for the increase of urea in the blood and since the retention of this salt does not necessarily suggest renal incompetence Ambard in 1910 introduced his urea coefficient which is based on a comparison of the amounts of urea in the blood and in the urine.

The author has tried this method in 35 cases: 5 being non-urinary cases 5 surgical renal cases 6 medical renal cases 13 prostatic hypertrophy cases 4 bladder cases and the other 2 diseases of the lower urinary tract. The conclusions are:

1. Ambard's coefficient is a very reliable method of gauging the state of renal function.

2. A constant of normal value does not imply freedom from disease but merely that the kidney has sufficient reserve capacity to meet an increase in the work thrown upon it.

3. A constant of increased value signifies that the renal compensation is either incomplete or totally wanting.

4. The constant often has diagnostic value for if a constant is associated with renal tuberculosis, one kidney only is affected.

5. The increased value of the constant resulting from diseases of the lower urinary tract may often be restored to normal after drainage of the bladder for several days. Inferring that the renal embarrassment is of a temporary nature only and secondary to the change in the urinary passages. Should this constant remain stationary or increase there is indication of the existence of some gross lesion of the kidney which would endanger further operative measures.

6. The method of determining Ambard's coefficient does not entail any discomfort to the patient nor is it necessary to control the diet.

7. The information as to the state of renal function gained to estimating the urea in the blood is amplified and completed by the determination of Ambard's constant.

W. E. LOWER.

SURGERY OF THE EYE AND EAR

EYE

Phillips, W. C. Clinical Types of Labyrinthitis with Comments on Treatment. *J. Am. M. A.* 97 April 336

The first type discussed which the author calls paralytic labyrinthitis refers to those cases of chronic suppurative otitis media which have vertiginous attacks without disturbance in the functions of the labyrinth. These patients complain of attacks of vertigo but they have hearing normal on the test, normal caloric test and no evidence of facial. The explanation offered is that in this type the disease has attacked but not yet eroded the long labyrinth capsule consequently the operative indication is to perform radical mastoid operation without disturbing the labyrinth.

When the process has progressed so as to erode the capsule but when the progression has been gradual so as to permit a walling off of the infective process and the disease has not as yet destroyed the membranous labyrinth there is present the circumscribed irritative labyrinthitis characterized by attacks of vertigo, nausea, and vomiting. Such patients may have a fairly acute hearing, the rotation test and the caloric test are normal but the fistula test is positive. In these, the radical mastoid operation only should be performed.

Diffuse labyrinthitis is considered under two heads: (1) those cases that present symptoms so-called manifest but (2) cases without symptoms so-called latent or chronic cases.

Concerning the differentiation between the serous and suppurative forms, the author thinks it unfortunate preferring the term grave for the cases called suppurative in which the labyrinth function is destroyed and reserving the term mild instead of serous for those cases in which despite the presence of labyrinthine symptoms the irritability of the labyrinth is retained.

A further division of the diffuse manifest labyrinthitis which complicates a true middle ear suppuration is made: (1) those which occur within the first three or four days of the disease (2) those which occur six, eight, or ten weeks after the beginning of the middle ear suppuration in the presence of an acute mastoiditis. In the first class the labyrinthitis is almost invariably mild or so-called serous. It rarely leads to any intracranial complication and frequently after the middle ear suppuration has run its course the function of the labyrinth, at least of the static labyrinth is restored. On the contrary the cases of labyrinthitis which complicate latent mastoiditis, and occur eight or ten weeks after the beginning of the acute suppurative otitis media

are almost invariably grave or so-called suppurative and frequently lead to intracranial complications, that is meningitis.

As regards treatment of the former type the labyrinth should not be touched, even though the hearing be lost and the caloric test negative because in many of these cases the function of the labyrinth at least of the static portion is restored.

In the latter type of the manifest as well as in the latent variety extirpation of the labyrinth is advocated preferably by the Neumann operation.

Otto M. Rott.

Eagleton, W. P. The Importance of Aural Symptoms in the Early Diagnosis of Tumor of the Cerebellopontine Angle. *J. Am. M. Ass.* 917 April 333

The author mentions as aural manifestations of cerebellopontine angle tumor: (1) Progressive deafness, beginning with a disturbance of the proper relationship between the degree of hearing and the tuning fork reaction, especially the duration of the bone conduction to the degree of deafness, and ending in (2) total deafness associated with (3) loss of vestibular rectibility of the affected side and during the time that the vestibular apparatus is still functioning (4) a gradual readjustment of the vestibular apparatus if the contralateral as well as the homolateral side is going on which is manifested by (5) a reduction even a temporary abolition of its rectibility to the old caloric (at least when applied in the upright position) (6) an absence of the vertigo and vomiting which normally accompany the induced nystagmus from the old caloric, and (7) absence of spontaneous pointing deviations. As the cerebellar cortex becomes affected may be added, (8) spontaneous nystagmus, (9) spontaneous pointing deviations and (10) absence during an induced nystagmus of the normal pointing deviations of the homolateral side.

Otto M. Rott.

Walker, G. W. The Use of Pure Carbolic Acid in Selected Cases of Chronic Middle Ear Suppuration. *Calif. St. J. Med.* 197 XI 34.

The author reports several cases to illustrate his method of successfully treating selected cases of chronic suppurative ear affections with pure carbolic acid. Through a perforation in the drum membrane or a fistula the pure carbolic acid is introduced into the middle ear followed in two minutes by alcohol. Care must be exercised to prevent any surplus carbolic acid from running down the neck by holding a pledget of cotton saturated with alcohol under the external ear and neutralizing at once any carbolic acid which escapes into the external auditory canal.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Kyle, J J : Dacryocystorhinostomy *Med. Times* 1917 xiv 46

After anesthesia with 20 per cent cocaine and adrenalin solution the nasal cavity is cleaned with some antiseptic solution and a quadrilateral flap of mucous membrane is formed anteriorly with a long slender knife to give approach to the fossa. With a long hollow chisel devised by West and driven by a mallet, the anterior wall of the fossa is broken away and the lachrymal sac will be noticed as a whitish mass which can be made to bulge by pressure externally with the finger or by pressing on the cannula in the lachrymal duct. The sac is then seized with special tooth forceps, freely incised with a knife, and emptied by pressure after which the attic of the nose should be packed for twenty-four hours with iodoform gauze moistened with vaseline.

The after treatment consists in keeping the nose cleansed and instructing the patient to make gentle pressure over the sac at least twice daily to establish complete drainage. ELLEN J PATTERSON

Denman, I O : The Relation of Maxillary Sinus and Dental Infections. *J. Ophth. Otol. & Laryng.* 1917 xxiii, 120

The gist of the author's conclusions is found in the statement that he believes more cases of dental trouble are due to maxillary sinus disease than maxillary sinus disease of dental origin. Hence the logical man to take care of antrum disease is the rhinologist. ORTO M. ROTT

THROAT

Crowe, S J, Watkins, S S and Rothhoix, A S : Relation of Tonsillar and Nasopharyngeal Infections to General Systemic Disorders. *Bull. Johns Hopkins Hosp.* 1917 xxviii, 1

This work is based on the study of 1,000 cases operated on at the Johns Hopkins Hospital during the past five years.

The relation of tonsillar and nasopharyngeal infections to general systemic disorders is discussed under various groups.

In infectious arthritis the predominating change is in the periarthritic tissues often with an effusion into the joint cavity. The onset is usually insidious, or may come on two or three weeks after an attack of acute tonsillitis. Only one joint may be involved but in the majority of cases many of the joints are affected. There is very little if any elevation of temperature and generally no redness around the affected joints. The joints are swollen and often

extremely painful on motion. There is no associated endocarditis.

The authors have removed the tonsils and adenoids in 91 cases of this type but were able to follow up and note the ultimate result of the joint condition in only 31. In 24 the joints were normal, both subjectively and objectively at the time of the last examination. In some the affected joints were much worse for a few days immediately following the tonsillectomy, but began to improve after two or three weeks. Often it was six or eight months before all joint symptoms entirely disappeared.

Four cases are classified as improved because the patients are now able to walk without pain. The affected joints however have never entirely cleared up and since the tonsillectomy have at times been much worse.

Two are not improved and one is in worse condition than at the time of the operation. One of these has a chronic ethmoiditis but refuses further operative measures.

Rheumatoid arthritis is the most malign form of joint disease. Many joints are involved as a rule and often the spine. The process is progressive and tends to ankylose many of the joints. There is no associated endocarditis.

In this group 9 cases were followed up and only 2 improved; 2 are not improved but no new joints have been involved. Of the 9 cases 5 are much worse, new joints have become involved and the patients are for the most part helpless invalids.

The conclusion drawn from this group of cases is that only in very exceptional circumstances should a patient with rheumatoid arthritis be subjected to an operation for the removal of tonsils.

Cases of myalgia or myositis are characterized by pain, stiffness and impairment of function of the muscles. There is no joint lesion.

In this group were 4 cases in which subsequent examinations were made. Two patients were examined two years after tonsillectomy and two one year after tonsillectomy. In all four cases the trouble had entirely disappeared.

Acute rheumatic fever is characterized by polyarthritis sudden onset, temperature 102 to 104 F, often heart lesions either endo- per- or myocarditis. The joints tend to clear up as the general symptoms abate but the cardiac lesion is permanent in many cases. The object in operating on these cases is to prevent a recurrence of either arthritis or endocarditis.

Of 25 cases in this group 4 have had recurrence after leaving the hospital, thus making it quite apparent that the tonsils are not the only portal of entry for the organisms that cause rheumatic fever.

From a study of the results of removal of the tonsils and adenoids in chorea, the authors have followed up 24 cases and are far from pleased. Two cases died during the year following the tonsillectomy with acute chorea. In one, the symptoms of chorea are still present nearly three years after the operation. In one the chorea is worse than at the time of the operation, one and one-half years ago. One case that had no symptoms of chorea before the operation has had two attacks of chorea since the tonsillectomy one and on third years ago.

Of the 3 cases of Sydenham's chorea in which the tonsils and adenoids were removed 8 have had recurrence. Of these patients 2 have had two recurrences each and one has had five separate attacks of chorea since the operation.

During the acute stage of chorea the authors consider tonsillectomy a dangerous procedure.

The type of kidney lesion believed to be due to a septic infection is that type in which the damage is primarily in the glomerular tufts. It is designated glomerulonephritis.

The condition occurred in 8 patients in 6 of whom there was a history of tonsillitis. In 8 of the cases either a cardiac joint lesion was found in association. As to the condition of the urine at the last examination, it was found normal in 12, eight months and 3.5 years respectively after tonsillectomy.

Hyperplasia of the cervical glands was the indication for tonsillectomy in 541 of the 1000 cases and of this number 366 patients were examined at periods varying from 1 month to four years after tonsillectomy. The following observations are recorded.

Of these 366 cases 90 now have tuberculous lesions though they showed no clinical evidence of a tuberculous infection of the lungs or glands at the time of the operation — 6 have pulmonary tuberculosis, 3 have tuberculous cervical adenitis.

At the time of tonsillectomy 93 of these 541 patients had some clinical evidences of a tuberculous adenitis or of quiescent pulmonary lesion. Of these 93 cases, 54 have been examined since their discharge from the hospital. 8 had developed pulmonary tuberculosis, 8 have tuberculous glands of the neck, one died of tuberculous meningitis one year after operation, one developed tuberculosis of the bones.

3. As regards the improvement in the condition of the glands as a result of the tonsillectomy the following was noted.

In 22 of the 366 cases there were no palpable glands in the anterior triangles. In 87 cases the glands in the anterior triangles are not larger than peas. In 36 cases the glands are still enlarged. In the glands are definitely tuberculous.

As a result of these observations concerning the effect of tonsillectomy on the cervical glands, the authors conclude that hyperplasia of the glands at the angle of the jaw so common in children and young adults, is an evidence of chronic infection of the nose or throat, the most frequent site being the

tonsils. Occasionally there is evidence of chronic tonsillitis without palpably enlarged glands but this is exceptional. When the glands at the angle of the jaw on one or both sides are palpably enlarged it is advisable to consider a removal of the patient's tonsils regardless of their size or appearance. If the glands do not subside after tonsillectomy their tuberculous nature should be inspected.

The concluding paragraph in this article is well worth our attention.

Tonsillectomy alone will not cure a tuberculous cervical adenitis or an arthritis or a glomerular nephritis. It is necessary in these cases to carry out all general measures that will tend to increase the patient's resistance. If the tonsils are the primary focus of infection, however, their removal may materially alter the prognosis by preventing a constant reinfection.

Many excellent points are brought out in the discussion which deserve extracting but because of lack of space we must refer the reader to the original, which will well repay any time spent in its study.

However, the author's summary regarding focal infections with especial reference to the tonsils is appended.

Focal infections may give rise to acute rheumatism, fever, simple and malignant endocarditis, septicemia, due to various organisms, some types of arthritis, myositis, and nephritis, neuritis, arteriosclerosis, general debility, and a great variety of nervous disorders designated as neurasthenia.

Focal infections may occur anywhere in the body but are perhaps more frequent in the accessory nasal sinuses, tonsils, teeth, gums and the genitourinary tract.

Neighboring glands become secondarily infected and may harbor the organisms and continue to infect the blood stream after the removal of the original focus. On this account general measures in the treatment of systemic diseases secondary to focal infections are of great importance.

Organisms entering the blood stream by way of a focal infection may have a specific affinity for the endocardium, the synovial membranes, the blood-forming organs, the muscles, or the kidneys. On the other hand, the selection of the organ involved may be due to the local chemical, mechanical or circulatory conditions.

As a general rule the focal infections that are most likely to give rise to secondary disorders elsewhere in the body are those in which there exists some obstruction to the natural channels of drainage.

A chronic tonsillitis may be defined as a condition of the tonsils in which there is an increase of fibrous tissue, adhesions between the tonsils and pillars, or some other evidences of an inflammatory reaction, together with palpable enlargement of the deep cervical glands at the angle of the jaw.

A chronic tonsillitis may result from frequent acute attacks, or from a long continued subacute inflammatory process secondary to pyorrhea, caries of the teeth, obstructed nasal passages, or chronic

infection of the accessory nasal sinuses or ears. In each of these conditions the tonsils are more or less constantly bathed with irrigating discharges. When searching for a focus of infection one must not forget that the evidence of chronic tonsillitis may be secondary to one of the above mentioned conditions. In such cases the removal of the tonsils without attention to the osseous sinuses ears or condition of the teeth may give very disappointing results. The patient may continue to have attacks of pharyngitis with swelling of the cervical glands, or inflammatory conditions of the larynx and bronchi that were never present before the operation. In this respect the tonsils and adenoids apparently protect the lower air passages.

From the standpoint of the treatment of an infectious arthritis or a glomerulo-nephritis, the removal of chronically infected tonsils leaving infected teeth or sinuses may be of no benefit but an actual injury to the patient. In the first place the surgical procedure is quite a shock to such patients and most important is the fact that organisms in the discharge from the sinuses teeth, etc. may continue to pass through the mucous membrane of the pharynx to the cervical lymph glands.

In every case where a tonsillectomy is contemplated, it must first be determined whether the tonsil infection is localized or is secondary to some chronic infection in the mouth or upper air passages. If the nasal passages and teeth are normal a removal of the tonsils and adenoids alone is indicated. If however there is any marked nasal obstruction sinus infection, alveolar abscess or extensive pyorrhea, these conditions should first be remedied before the operation on the tonsils is undertaken.

These precautions not only insure a relatively clear field for the tonsil operation but the ultimate results of the tonsillectomy will be more favorable in any large series of cases. OTTO M. ROTT

Capelle, W.: The Plastic Reparation of Laryngeal Tracheal Defects (Über plastischen Ersatz von Kehlkopf—Luftröhrendefekten) *Beitr. z. klin. Chir.* 1916 xcix, 403

Capelle first discusses the various procedures adopted from time to time for the plastic repair of laryngeal and tracheal facerations. Kuester's transverse resection Hohmeier's transplants of fascia lata the osteocutaneous strips of Schimmelbusch, Phyllades Lardy Mangoldt and Nowakowski.

The author describes his plastic method, carried out in a personal case of a defect due to a shrapnel shot for which tracheotomy had been twice executed. The wound healed and the treatment of the defect came to the author. Capelle cut a rectangular strip of skin obliquely from the left supraclavicular fossa the base of which corresponded with the left margin of the defect. The strip being dissected out the free external margin was fixed to the mucosa of the right margin of the defect. A

second strip of skin was then prepared with its base in the right supraclavicular fossa and its extremity on the sternal manubrium. In this dissection a good tract of the external table of the sternal manubrium was left adherent to the cutaneous strip. The extremity of this strip was brought upward so that its osseous surface was placed in contact with the subcutaneous surface of the first strip and its cutaneous extremity fixed to the external surface of the base of the first strip.

The defect was therefore filled up with a triple layer cutaneous osseous and cutaneous. The operation was quite satisfactory and the patient's respiration was very good six months later.

W. A. BRENNAN

MOUTH

Beebe H. M.: Focal Infections in Relation to General Surgical Conditions. *J. Ophth. Otol. & Laryngol.* 917 xliii 128

The author mentions appendicitis gall bladder disease ulceration of the upper gastro-intestinal tract goiter and enlarged cervical glands as some surgical conditions due to focal infection, the origin of the secondary trouble dating from the time when the patient's resistance became reduced. The leukocytic barrier which protects the rest of the body from a focus of infection is broken down by exposure overexertion, trauma, dietary indiscretions etc. thus permitting secondary deposits of septic material. This deposit occurs first in those organs less thoroughly protected by nature as for instance the appendix and gall bladder.

OTTO M. ROTT

Mitchell V. E.: Artificial Restoration of Lost or Missing Tissues in Congenital Cleft Palate and Other Deformities of the Mouth. *Dental Cos.* 1917 7 lix 185

Co-operation is necessary between the surgeon and dentist in bringing about better results in the treatment of cleft palate. In those cases where a lack of tissue prevents surgical success, a prosthetic restoration of the tissue undoubtedly gives better results.

The two reasons for attempting to correct this defect either surgically or mechanically are the improvement to the general health and the improvement of the voice and speech.

Many appliances have been devised for the closure of the cleft but with little regard to the restoration of the nasal passages to permit normal respiration or to the restoration of the resonance chambers for the improvement of the voice and speech.

The author has devised his appliances with the idea of attempting to restore all missing tissues and their functions, and reports many cases to prove their successful restoration. ELLIS J. PATTERSON

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included. By catching the suture at two equidistant points with forceps and the untied ends between the fingers, sufficient tension can be maintained to serve the double purpose of steadying the parts and reducing the soiling of the field to a minimum. While the suture is being held the pencil point of a thermocautery is made to slowly burn a hole into the intestine. The cautery is preferable to the knife or scissors.

Whenever it is possible to do so the omentum should be drawn about the tube and, if need be, stitched in place by one or two fine plain catgut sutures. A splendid plan is to puncture the omentum and pass the distal end of the tube through it. Utilization of the omentum to safeguard the intestinal opening both before and after the tube has been withdrawn can not be too strongly emphasized.

When the perforation has been done with the cautery the edges properly invaginated and the parts surrounded by omentum the fistula usually heals of itself very promptly. The author has had fistula that did not leak a drop either before or following the removal of the tube. While there is no operation more serviceable than an enterostomy when indicated there can be nothing more annoying than a fecal fistula that will not heal. The technique presented reaps the benefits of the one and avoids in a large percentage of cases the evil effects of the other.

Quain E. P. A New Instrument for the Application of the Sewing Machine Stitch in Gastro-Intestinal Surgery. *T West Surg A* St Paul 9 6 Dec.

Absolute hemostasis is necessary for safe and successful gastro-intestinal surgery. Attention is called to the double interlocking through-and-through, running suture made by the ordinary sewing machine. Wherever this type of suture can be applied to living tissues bleeding is practically impossible. A special curved needle has been made with an eye near the point and a flat handle to which one end of the catgut is fastened. The catgut runs in a groove on the convex side of the needle shaft through the eye near the point and the other end is tied to a long needle which serves as a shuttle. The special needle is pushed through the tissues about to be sutured until the eye with a loop of catgut appears on the opposite side. The shuttle needle carrying the other end of the catgut is passed through the loop and the special needle is withdrawn. This forms the interlocking sewing machine stitch and is the one used for the posterior suture in gastrojejunostomy. For the anterior suture line the same stitch is made by passing the needle from inside the jejunum out through the serosa, then over to the gastric margin which is penetrated in reverse order. The catgut loop is picked up by the shuttle needle on the gastric mucosa.

Quain has used this suture in 17 gastro-enterostomies and excisions of gastric ulcers, and in 3 bowel

resections. To prove its hemostatic efficacy gastric lavage was given after the gastro-enterostomy. Only an occasional shred of clotted blood which probably escaped during the operation was found in the stomach. By this method he has been able to save nearly half the time previously employed in gastro-enterostomy.

This method has place in other surgical fields. It has been applied with satisfaction in hemi-orthoectomy, thyroidectomy etc. but it is not practical for skin suture.

Draper J. W. Intestinal Obstruction. *J Am M Ass* 9 6 1 1080

The cause of death in intestinal obstruction is still unknown but all recent studies point to aberrant activity of the duodenal and probably pancreatic cells. The old hypothesis that the toxin is of bacterial or food decomposition origin may be looked on as discarded. Dehydration is of no greater importance in this than in other toxemias.

There is an important ratio between the toxicity of the intestinal epithelium and its digestive power. The intricate syndrome autotoxemia occurring in man will be better understood when we know the cause of death in duodenally obstructed dogs.

Edward L. Corbitt.

Starr C. L. Intussusception. *Canad J M & S* 9 6 1 33

The paper is based upon 46 cases with 31 deaths and 5 recoveries. The time of admission varied from three hours after the onset of symptoms to eight days. The average time of admission of all cases of intussusception during the past 15 years at the Children's Hospital has been fifty-seven hours. The best time to diagnose a case of intussusception is during the first twenty-four hours. The average admission time of the fatal cases was seventy-four hours and the admission time of the recovered cases was thirty-two hours after the onset of symptoms.

In regard to the etiology, in most of the cases there was a history of intestinal disturbance, either marked constipation or diarrhoea and it was also a fact that three-fourths of the cases occurred in the summer months when intestinal infections are most frequent.

In a child under two years of age the onset of acute pain, vomiting, collapse, one or two fecal stools followed by straining and the passage of blood and mucus and possibly palpable tumor are characteristic diagnostic signs of intussusception.

In iliocecalitis there is always some fecal content whereas in intussusception no bile or bowel content passes after the first one or two stools.

The author believes that surgery is the only treatment and the diagnosis is readily made within the first twenty-four hours. If operation is performed within the first twenty-four hours it is comparatively easy to reduce the intussusception. It is after this period that the amount of con-

gestion and edema of the tissues makes reduction almost impossible and the only operation in the nature of a resection that the author advocates is the so-called Jessup's operation. C G HEYD

Eddy I H: Perforation in Typhoid Fever; Report of a Case Associated with Acute Typhoid Appendicitis in a Child Aged Seven. *Surg Gynec & Obst* 19 6 JUL, 451

The frequency of perforation varies greatly in different epidemics. The authors' study of the literature shows that about 12 per cent of the total death rate is due to this complication and that about 80 per cent of the perforations are found in the lower ileum 50 per cent of the perforations occur during the second and third week and the trouble is twice as frequent in adults as in children. Jopson was able to find only 21 cases under ten years of age prior to 1909. Violent muscular movements, distention, diarrhea, vomiting, dietetic errors, and separation of the slough are given as factors predisposing to perforation.

The onset is sudden and is characterized by severe pain of rapid progressing intensity, local tenderness, chill, vomiting and collapse associated with a rapid rise in temperature, pulse rate, blood pressure, and leucocytosis.

The importance of an immediate diagnosis is emphasized and the differential diagnosis of acute appendicitis, hemorrhage, ileus, acute intestinal obstruction, acute pelvic lesions and infections of the gall-bladder are discussed in detail.

The treatment is surgical. In the choice of incisions one should not lose sight of the fact that 80 per cent of the perforations occur in the lower part of the ileum. The perforation can be closed in most cases by a purse string suture reinforced by Lambert or mattress sutures care being taken not to constrict the gut. Free drainage should be established, the Fowler position assumed and morphine employed until the peritonitis becomes well localized.

The case is reported of a child age 7 who complained of headache, August 28 was seen by Dr Nicholson September 9 temperature varied from normal to 105. Was seen in consultation by the author September 15. September 17 at 7 p m the patient was seized with a chill, vomiting and severe pain in the right side followed by collapse. The temperature rose from 102.8° to 105.6° pulse from 120 to 160 in two hours leucocytes 32,000.

The child was removed to the hospital for immediate operation. The appendix was removed in perforation about 16 inches from the ileocecal valve closed and two additional ulcers that showed clearly through the peritoneum reinforced. The child made a splendid recovery and was shown at the Chicago Medical Society at the time the paper was presented. The author's conclusions are as follows:

1 While perforation varies greatly in different epidemics, about 12 per cent of the total death rate is due to this complication.

2 Perforation occurs in about 3 per cent of all cases treated. It is relatively infrequent in children.

3 Statistics show that over 80 per cent of the total perforations occur in the lower ileum.

4 The location of perforation coincides with the study of Baer.

5 The majority of cases perforate during the second and third week.

6 Diarrhea is an important factor in its production.

7 Acute abdominal pain during the course of typhoid should always be taken seriously.

8 The sudden rise of blood pressure is positive evidence of perforation while an unchanged pressure is not of negative value.

9 The importance of a careful study of the blood cannot be overestimated.

10 The welfare of the patient depends on the physician's ability to differentiate between the symptoms of perforation and those of the resulting peritonitis.

11 The treatment of perforation is surgical and the death rate is in inverse ratio to the length of time allowed to elapse before operation.

12 Oplates are indicated as soon as perforation has taken place and should be continued until the peritonitis has become well localized.

Nix, J T Jr. Rare Case of Intestinal Stasis and Its Treatment. *South M J* 1916 ix 908

The author reports the case of a woman 34 years old who had suffered with symptoms of intestinal stasis for more than fifteen years. The transverse colon was hopelessly kinked from caecum to sigmoid exhibiting the most extreme type of ptosis.

At operation adhesions between various surfaces of the small bowel and abdominal parietes were thoroughly divided and the raw peritoneal surfaces sponged with a sterilized 3 per cent solution of sodium citrate in order to prevent subsequent adhesions if possible. The lower end of a Murphy button was inserted in the rectum and held in position at the beginning of the sigmoid. The ileum, at a point near the ileocecal valve was divided between clamps with a Paquelin cautery. The caecal end was closed by a continuous suture and inverted with a purse string stitch while into the upper end was inserted the other half of the Murphy button. The halves of the button were joined and the operation completed. After twelve days the button had not passed but with a little traction upon the silk tape it was easily removed. The patient made an uneventful recovery.

The advantages of the application of the Murphy button for short circuiting are:

1 Simplicity. The method is shorter by fifteen minutes than the suture method.

2 The most dangerous section of bowel from an infectious standpoint the colon is not incised but simply punctured with a Paquelin cautery thereby eliminating contamination.